DOCUMENT RESUME

ED 074 959 HE 003 936

AUTHOR	Eko, Ewa U.
TITLE	The Life Sciences and Society: An Approach to the Study of the Black Experience.
INSTITUTION	Six Institutions' Consortium, Greensboro, N.C.
PUB DATE	Apr 72
NOTE	107p.; Proceedings of the Annual Invitational Workshop on African and Afro-American Studies (3rd, Greensboro, North Carolina, April 28-29, 1972)
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	African American Studies; *Biological Sciences; Higher Education; *Negroes; Negro History; *Negro Leadership; *Scientific Research; *Scientists; Workshops

ABSTRACT

Many college and university programs in African and Afro-American Studies have emphasized only the history, arts and culture of the peoples of African descent. The Life Science Project of the Six Institutions' Consortium was therefore a unique departure from all extant programs in African and Afro-American Studies. Its focus featured research into the activities of black scientists, dead and living, that have yielded considerable impact on the life sciences and society. An invitational workshop, of which this document is the report, featured seminars, reports, discussions, exhibits and films that emphasized the contributions of black scientists to the Life Sciences and the considerations in these sciences that have special relevance to the lives and conditions of black people. The proceedings of the major sessions of the workshop are offered in this publication for the benefit of all who are interested in encouraging the teaching, learning, and research and of the contributions of black scientists to the life sciences and society. (Author/HS)

FILMED FROM BEST AVAILABLE COPY

ED 074959

THE LIFE SCIENCES AND SOCIETY

An Approach to the Study of the Black Experience

Proceedings of the Third Annual
Invitational Workshop on
African and Afro-American Studies

Greensboro, North Carolina
April 28-29, 1972

Editor: Ewa U. Eko
SIX INSTITUTIONS' CONSORTIUM

HE 003 936

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

CONTENTS

Preface---------- iii

The Life Sciences Project 1971-72---------- iv

Black Scientists and Their Contributions To Life Sciences and Society---------- 1
Samuel Massie

Race: Social Implication for The Life Sciences---------- 14
Jacqueline J. Jackson

The Ecology of Human Relationships---------- 28
Dorothy Williams

Genetics of Afro-Americans---------- 38
David T. Ray

Genetic Engineering and its Implications for the Black Community---------- 50
Lynette Padmore

Nutritional Problems of Black Americans: Implications for Future Strategies in Health, Socio-Economic and Education Problems---------- 57
Cecile H. Edwards

Diseases Prevalent in Socio-Economically Deprived Black Communities: Etiology and Intervention---------- 73
William West

Acknowledgement ---------- 101

PREFACE

Many college and university programs in African and Afro-American Studies have emphasized only the history, arts and culture of the peoples of African descent. These have served to highlight their contributions as being only those of the humanities and social sciences. And yet significant contributions to humanity have been made by black people in the sciences as well.

The Life Science Project of the Six Institutions' Consortium was therefore a unique departure from all extant programs in African and Afro-American Studies. Its focus featured both research and re-search into the activities of black scientists, dead and living, that have yielded considerable impact on the life sciences and society. Of interest also, was the analysis of research that has been done to-date about and by African peoples in the various areas of the life sciences with particular reference to the problems of evolution and race, disease, nutrition, genetic engineering and human relationships.

In an attempt to share the output and experiences resulting from the project, an Invitational Workshop was held for hundreds of educators and students from colleges and universities across the nation on April 28-29, 1972. This was the Consortium's Third Annual Invitational Workshop on African and Afro-American Studies, which, like its predecessors, was designed to provide opportunity for mutual exchange of new knowledge, curricular approaches, and materials for effective learning and teaching of the Black experience.

With a focus on *The Life Sciences and Society: An Approach to the Study of the Black Experience* the program of the Third Annual Invitational Workshop featured seminars, reports, discussions, exhibits and films. The presentations emphasized the contributions of black scientists to the Life Sciences and the considerations in these sciences that have special relevance to the lives and conditions of black people. The proceedings of the major sessions of the workshop are offered in this medium for the benefit of all who are interested in encouraging the teaching, learning, and research of the contributions of black scientists to the life sciences and society.

Ewa U. Eko, Coordinator
Six Institutions' Consortium

LIFE SCIENCES PROJECT, 1971-72

During 1971-72, the Six Institutions' Consortium carried out a project in the Life Sciences as a part of its curriculum development program in African and Afro-American Studies. The project was made possible by a grant from the United States Office of Education under Title III of the Higher Education Act of 1965.

The program emphasis of the project was on the contributions and considerations in the Life Sciences which have relevance for Black Americans. Not only was an effort made to identify black scientists, who have made worthy contributions to the Life Sciences, but attention was paid to the studies that have been made in biology (genetic, ecological, molecular and biochemical factors) of race and evolution, nutrition and disease. The relationship of these studies to the special problems of the black minority in a racist society were emphasized. In each of the areas, consideration was given to the human adjustment and corrective measures which contribute to mental health.

The operational thrusts of the project included:

1. The collection and analysis of data pertaining to the significant contributions of black scientists in various areas of life sciences. These materials will be used in the enrichment of existing courses and in the development of new courses at participating colleges.

2. The determination of those aspects of science that have special relevance to black people through research.

3. The initiation of an image of success among our students by giving them opportunities to meet and get acquainted with successful black scientists.

4. An exploration of unique innovations in teaching methodology that have been found to be particularly effective in teaching black students.

Monthly seminars and workshops, conducted by well known scientists, were held for faculty and students on the campuses of all six member institutions of the Consortium in rotation. The foci of these sessions were:

"The Life Sciences and the Black Experience"

"Scientific Methodology: Re-search versus Research in the Black Experience"

"Current Issues and Opportunities in the Life Sciences"

"Evolution and Race" "Genetics"

"Human Relationships" "Diseases"

"Nutrition"

Outside resource persons who worked with the project participants were Samuel M. Nabrit, John D. Withers, Jacqueline J. Jackson, Joan Creager, David T. Ray, Henry Moses, Betty Pelham, Cecile H. Edwards, Dorothy Williams, William West, Roy Hunter, Lafayette Frederick and Harold Finley.

The Life Science faculty, students, and librarians were also involved in intensive literature search and study. A computerized print out of Biological Abstracts of studies, published between 1968 and 1971 relating to Africans and Afro-Americans, was obtained. A study of Black Scientists and their contributions to the life sciences was also launched. Results of these projects are being compiled for distribution to all who will need them.

The results of the year's project was shared with more than 200 faculty, students and educators from colleges and universities in the country, at the Consortium's Third Annual Invitational Workshop on African and Afro-American Studies, held at Bennett College, April 28-29, 1972.

The institutional project participants were:

Barber-Scotia College

Emma Witherspoon

Bennett College

Evelyn G. Jones

Livingstone College

Ozell K. Beatty

St. Augustine's College

Wilbert W. Johnson

Shaw University

Kalyan Ghosh/Phaon Goldman

Winston-Salem State University

Wilveria Atkinson

Staff: William Alcorn, Media Specialist
Frances Harris, Secretary
Ewa U. Eko, Project Director

SAMUEL P. MASSIE, professor of Chemistry at United States Naval Academy, Annapolis, is a well known educator and scientist who has more than twenty years of professional involvement in college and university teaching and administration, in industrial and military research, and in community and social organizations. He received his Doctor of Philosophy Degree in Organic Chemistry from Iowa State Univeristy, and was President of North Carolina Central University, 1963-66. A former chemist with Eastman Kodak Company and Associate Program Director of the National Science Foundation, Dr. Massie has served as professor of and chairman of the chemistry departments of three leading institutions. During World War II, he participated in military research, working on chemical warfare agents, the atomic bomb, and antimalarial agents. His research interests are in drugs and he has received over fifteen grants from which more than twenty-five publications have resulted. He is currently writing a series of articles on black scientists for CHEMISTRY. Dr. Massie has received many honors and awards and is a member of many educational, scientific and social organizations. He is an active community worker, and is engaged in several national projects.

BLACK SCIENTISTS AND THEIR CONTRIBUTIONS TO LIFE SCIENCES AND SOCIETY

Samuel P. Massie

Ladies and Gentlemen, I am honored to join you tonight in participating in an experience in which too few people have participated, that is, a look at the contributions of black scientists to the improvement of our way of life.

It is one of the sad commentaries of history that black people have been bypassed. It is an even sadder commentary that we have let ourselves be bypassed. We have been studied. Oh yes, we have let other people study us. And those of you who are scientists know that he who gets the data and figures can do with them what he will. He can make it prove anything. I have seen physicists draw a straight line with only one point. I have seen chemists who could describe a reaction as proceeding a certain way with a yield of 5% without telling what happended to the other 95%. You see, you can do with data what you will. And this is what we have let happen to us. We have let other people write about us, tell our story in their words. And it is time now that we say some things. Too few of us know anything about our heritage. And so tonight I would like to share with you some of my information. It has been my privilege to have done some of this previously. I am writing a series of articles for a magazine called CHEMISTRY on black chemists. And I plan to write a book on the contributions of black scientists.

A poet once wrote these lines -

When we lie down worn out, Other men will stand young and fresh.
By the steps we have built, they will climb.
By the stairs we have built, they will mount.
They will never know the names of the men and women who built them.

At the clumsy work they will laugh.
And when the stones roll, they will curse us.
But they will mount, and on our stairs, they
will climb.

This seems to be an appropriate way to describe the persons who are listed on the first slide I wish to show you. I have listed five men, who in their way made unique contributions. The name I listed first was DANIEL HALE WILLIAMS, the black physician who, in 1892, performed the first open-heart surgery and also founded Provident Hospital in Chicago. I list him because he was a man who, when society would not give him what he wanted, needed, or deserved, made his own. In the days when people said "you can't do that," Daniel Hale Williams did not know the meaning of can't. And so he tried, and he succeeded. Medicine, in general, will always be indebted to this black man, who had the courage to go when others said, "don't go".

The second name, ERNEST JUST, was a biologist. In those days, it was felt that a black person should just teach, without advanced degrees, and should not do research. But Ernest Just saw that you could not dispense knowledge unless you also produced it. His own people told him to quit. And Ernest Just selected a very difficult area - Enbyrology. He was prehaps one of the first black life scientists to do meaningful research that was publishable. He was also one of the founders of Omega Psi Phi Fraternity. Now there are other teachers and scholars that I might have mentioned. I should have mentioned Charles Turner from St. Louis or Julian Lewis from Chicago. But I listed Ernest Just because he did his work at a black institution, Howard University.

The third name listed is that of a more recent scientist, CHARLES RICHARD DREW. His name is cogent in North Carolina and particularly in Greensboro and Guilford County because here in Guilford County Charles Drew who founded the Blood Bank, died because as a Negro, he could not get some of the very blood he had helped set

up. Charles Drew died as he was coming here to Greensboro to speak to a medical meeting. They gave him money to come on the train. But he wanted to bring some students, to give them the benefits of attendance at a medical meeting, and the students had no money. Charles Drew worked in the operating room all day at Howard. He should have gone to bed and gotten some sleep. But he had promised that he would be here the next day. So after a full day, he and his students left Washington, driving late at night. He was tired, he went to sleep, and ------crashed near Burlington.

Another great man who just recently passed was THEODORE K. LAWLESS. He was a dermatologist. Negroes have always had trouble with their skin. Whites have too. He made lots of money. But he was willing to share it, and he was one of our greatest benefactors. We haven't had many Negroes who make enough money to give any away. But T. K. Lawless did, and many institutions, especially Dillard University, were the beneficaries of his philantrophy.

The fifth person was a pioneer surgeon and hospital administrator, LOUIS WRIGHT. He was the first black director of the Harlem Hospital. It was stated "that black men can't run anything successfully". It has often been felt that we didn't have it. And we have believed them. And he converted Harlem Hospital, which really wasn't a very good hospital into one of the major training hospitals of our time. Many of our physicians, especially those educated at Howard Medical School, secured their internship at Harlem Hospital.

Now there are other pioneers I could and perhaps should have mentioned. Benjamin Banneker, a mathematician, wrote an almanac and laid out plans for the city of Washington during Revolutionary times. Edward Bouchet earned Phi Beta Kappa and was awarded the Ph.D. degree in Physics from Yale University in 1867. William A. Hinton was on the staff of Harvard University, developed a test for syphillis, and was probably the only instructor emeritus in Harvard's history.

But these five men exemplify the spirit of the pioneer black scientist in other fields. The first name is GEORGE WASHINGTON CARVER, not only because of what he did with the peanut and sweet potato, but because of what his imagination showed. He saw in a little peanut and other agricultural products in the South something that no one else had seen. He helped free the South and the world from the domination of the cotton crop. Now as an outgrowth of his studies many of our agricultural crops are grown more for their industrial use than for their actual food value. In addition to his historic role of showing the worth of the black man, this was Carver's great contribution.

Now I am biased about the next man, ST. ELMO BRADY, because he was my teacher. He was the first black man to receive a Ph.D. degree in Chemistry. He would often tell us the story of his work at the University of Illinois. When he entered in 1912, there were 16 whites and one other. The next year there were 12 whites and one other. The third year saw 10 whites and one other. When he graduated there were five, four whites and one other.

After graduation, Brady was invited to take a job in industry - to be an example. But Brady wanted other blacks to receive the benefits of a good education. So he returned to his teaching post at Tuskegee Institute and helped that Chemistry department get on a firm footing. And then he went to Howard University, where he secured an appropriation for a Chemistry building, and established a respectable undergraduate chemistry curriculum. And then he got a call from his alma mater, Fisk University. There he spent 25 years, and there is where I knew him. There he built the first building at a black school exclusively for Chemistry, developed an outstanding graduate (M.A.) program and established the Talley Lecture Series. Then in 1952, he retired. At this time most of us would have quit. We would have said to ourselves, "I have been at three schools - I have set up three departments" but Brady said, "No. There's some more work to be done". And he went to where most of us wont go - even now,

MISSISSIPPI. He felt that there was a job to be done at Tougaloo College. And before he died, he had secured funds to build another chemistry building - this time, at Tougaloo.

Here was a man who built four departments. He was also an agricultural chemist. He was a great teacher. His favorite examination method was "chalk and talk". I never heard him raise his voice. I never heard him use a swear word. But he could raise you as high as the sky or make you feel lower than a dog. He had a way of looking at you. But when he finished, you were prepared.

In 1921 Negroes began to move into industry. Well, they were hired in industry. But they always worked for some one else - they were never boss. And then Griffith Laboratories in Chicago, a spice company, hired LLOYD A. HALL. And you know within a year he was the boss. Under his leadership, Griffith Laboratories became a major food-processing company. He was honored by many organizations, including the American Institute of Chemists.

The fourth pioneer I wish to mention is ELMER S. IMES, a physicist who was one of the first American scientists to carry out significant research on the infra-red spectrum, a significant tool in organic analysis. His work was done at the University of Michigan, and later he taught at Fisk University.

My third group of scientists concerns three men who have almost retired from the scene, but remain active.

One of the great medical teachers in Howard's history and the first black man to be an officer in the American Association for the Advancement of Science is W. MONTAGUE COBB. He is presently a Visiting Professor at Stanford University, and the editor of the Journal of the National Medical Association. He pioneered in the teaching of Anatomy. Many of the black doctors of our time will testify to the work of Cobb.

The second man is perhaps one of the greatest of all Biology teachers, DR. SAMUEL M. NABRIT. Dr. Nabrit is now the Executive Director of Southern Fellowship Funds, and before that he was President of Texas Southern University and the first black member of the Atomic Energy Commission. But it was as Dean of the Graduate School and Professor of Biology at Atlanta University that Sam Nabrit made his mark as a teacher and a scholar. Perhaps more of his students went on to the Doctorate in Biology than any other black biology professor.

The third man is RUSSELL W. BROWN, a bacteriologist. For several years he directed the Carver Foundation. He is now a Visiting Professor at the University of Nevada.

And now comes a man whom some consider one of the greatest of all times, DR. PERCY L. JULIAN. I was a visiting scientist at his alma mater, Depauw University last week. He went there in 1916 from his home town of Montgomery, Alabama. His family wanted him to be a doctor, but he wanted to be a chemist. When he went to DePauw, they didn't want black students. When he went there, he had to take remedial mathematics and English as he wasn't ready, and even today, too many of our students aren't ready when they finish high school. But he worked hard, overcame his handicaps, and in 1920 graduated as valedictorian. But graduate schools weren't ready for blacks so he went to Fisk and taught for two years. He then obtained a scholarship and went to Harvard University. He was so smart that he got his master's degree in one year. Harvard kept him on as an assistant, but would not give him faculty status. Finally in 1926, Julian decided that he had enough of Harvard and went to West Virginia State College to teach. In 1927, after Brady left Howard, Julian went to Howard as Head of the Department. But he realized that he could not do the job that he wanted to do at Howard without his doctorate. He went to the University of Vienna where he studied with a great chemist, named Dr. Ernest Spath. He got his degree, came back to

this country, and his alma mater, DePauw University invited him there. The Dean and the President recommended him for faculty status, but the Governing Board at DePauw wasn't ready. He remained there three years, carried out outstanding research, including the synthesis of phygostimme - all of the students flocked around him. Then the University of Minnesota wanted to hire him, that is the Dean and the President, but again a Governing Board wasn't ready. The Institute of Paper Chemistry at Appleton, Wisconsin hired him only to find that there was a city ordinance in Appleton which said that "Negroes couldn't sleep in the town overnite".

Finally, Glidden Paint Co. hired him to make soybean paste. But Julian knew that there was more in soybeans than starch for wallpaper paste. And in the laboratory, he extracted sterols, which are raw materials for sex hormones. He did so well that Glidden established a Soya Beans Products Division and made him Research Director. Now a problem arose. Most research directors are vice-presidents. But when Julian raised the question, Glidden wasn't ready. Julian then founded his own company Julian Laboratories, which he later sold to Smith-Kline and French Inc. for over two million dollars, remaining as President. And even today he is active in Julian Laboratories. I feel sure that he was ahead of his time, that he would have won a Nobel prize with the present day opportunities.

Now because medicine is so closely related to the life sciences, I have listed in my next group several contemporaries in medicine that I know. Again, I may have left out some that you would have included.

The first of these is an outstanding physician-scholar named NATHANIEL O. CALLOWAY, who is Regional Director of Veteran's Hospitals in Wisconsin. Calloway was the first black to obtain a Ph.D. in Chemistry from an institution west of the Mississippi. Growing up in Tuskegee, he went to Iowa State College,

Carver's alma mater, where he earned his undergraduate degree and his Ph.D. in 1933. After teaching at Tuskegee and Fisk (he also taught me there), he decided he wanted to enter medicine. He went to the University of Chicago, then into private practice and group medicine, while all of the time he pursued scholarly research. Calloway is an outstanding example of a good physician who is also an outstanding scholar.

The second name listed is that of an outstanding pharmacologist, WALTER M. BOOKER, head of pharmacology at Howard University. With the many new drugs available, he has done an outstanding job in helping young physicians understand better the use and significance of these drugs.

The next man is one of our most outstanding pediatricians, E. PERRY CRUMP. He has done more research than any black pediatrician and more than most whites. His research program is over 20 years old. He conducts a well baby clinic. A lot of teachers state "I would do research, but I don't have time", Crump puts a lie to this excuse.

My next personality, and by coincidence, his neice is in the audience, is an outstanding meuropharmacologists at Meharry, CHARLES D. PROCTOR. He was the first black faculty member at Stritch School of Medicine of Loyola University in Chicago before coming to Meharry. It happens that his last name, PROCTOR, is my middle name, and we call each other (cuz).

An outstanding bacteriologists who was one of the first blacks appointed to a white faculty is CHARLES W. BUGGS, who taught at Wayne State University in Detroit for many years before coming to Howard. He is now in Los Angeles.

Finally, I wish to mention an outstanding psychiatrist, DR. LLOYD ELAM, who is also President of Meharry Medical College.

My next group of men includes three contemporary biologists. I have listed them because I know each of them and feel that they are doing outstanding jobs.

The first person is JAMES H. M. HENDERSON, director of Carver Research Foundation at Tuskegee, who is continuing the fine tradition of the late Clarence Mason. Henderson is a cancer researcher, and incidentally has been awarded the highest Boy Scout Award. He is another good teacher who has not let good teaching prevent him from producing research.

The second personality is HAROLD E. FINLEY of Howard University. Next to Nabrit, he has probably seen more of his students receive Ph.D.'s, and with Howard's Ph.D. program has probably directed the research of more Ph. D.'s than any other black Biology professor.

The third name, JAMES JAY, of Wayne State University is listed because he has recently written a book with extensive data on Negroes in Science.

Now we have been talking about men so much, you may have forgotten that my favorite subject is women. And black women have achieved in Science. I have listed six as examples. Two of them you may know because they have taught at A&T State University.

I listed CECILE HOOVER EDWARDS, who is now Chairman of the Home Economics department of Howard University. Cecile, the first Negro woman (there's no way you can call Cecile black) to receive her Ph.D. from Iowa State University has published extensively in the field of nutrition.

The second person is GLADYS WILLIAMS ROYAL, the only woman listed by the Anacostia Museum of the Smithsonian Institute in its booklet "They were Determined" is now associated as a biochemist with the Department of Agriculture. Both Drs. Edwards and Royal taught at A&T State University.

The third woman, DR. MARIE TAYLOR, is head of Botany at Howard University, and has been directing programs in radioactivity. The fourth young lady, DR. PEGGY ALSUP, one of my former students, is head of the sickle-cell anemia program at Harlem Hospital. The fifth person, DR. DELORES COOPER SHOCKLEY is a pharmacology professor

at Meharry. She is a native of Mississippi, and after graduation from Tougaloo, she became the first black woman to graduate with a Ph.D. from Purdue University. She has done extensive post-graduate study in Denmark and Sweden.

Finally, I wish to pay tribute to DR. DOROTHY BROWN, professor of Surgery at Meharry Medical College, who in addition to a career as a surgeon was elected to the House of Representatives in Tennessee.

And now I wish to pay tribute to those scientists who have become college presidents. The first of these is DR. FREDERICK DOUGLASS PATTERSON, a bacteriologist who became the third president of Tuskegee Institute. After retirement from Tuskegee he founded the UNITED NEGRO COLLEGE FUND. In Chemistry one of the highest honors you can receive is the MCA Award for outstanding college chemistry teaching. It is given to 3-6 persons out of more than 10,000 teachers The last black person to win the award was CARL M. HILL, president of Kentucky State College, who at that time was Dean and professor at Tennessee A. and I. State University. Likewise one of our great physicists and educators who worked with Dr. Linus Pauling in his revolutionary studies on the helix structure is HERMAN BRANSON. Dr. Branson, formerly head of the physics department at Howard University became President of Central State University in Ohio and is now President of Lincoln University. ROY HUDSON, an outstanding pharmacology teacher at Brown University, is now president of Hampton Institute. DR. WILLIAM J. L. WALLACE, a chemistry professor has been President of West Virginia State College for over fifteen years. Dr. LUNS MISHOE, a physicist is President of Delaware State College. JAMES R. LAWSON, an infra-red physicist is President of Fisk University. RUFUS P. PERRY, a chemist was President of Johnson C. Smith University. And finally, our host President of Bennett College, DR. ISAAC H. MILLER, JR., is an outstanding biochemist.

I now wish to list some outstanding contemporary black chemists. They have just established a school in Florida called Florida International University.

It does not even open until next year. For the Dean of their Health Sciences, they have chosen a young black biochemist, VANDON E. WHITE.

The American Chemical Society (ACS), the world's largest professional organization has just named their candidates for President-Elect. One of the candidates will be HENRY A. HILL. a black man who owns his own research laboratories (Riverside) at Haverhill, Mass. He is now a regional director of the ACS. We hope that he wins, we shall vote for him and work for him, but the very fact that he was nominated as one of three out of 102,000 is significant. He has a tough row to hoe because one of his opponents has been Chairmen of the Board of Directors of the ACS for the past three years.

The third man I have listed, LLOYD M. COOKE, was the first black man to run for the President of ACS. He is now Vice-President of Union Carbide and a member of the National Science Board.

Some of you may remember when they would not let James Meredith into the University of Mississippi. At the same time the textbook used in the graduate course in organic chemistry was written by a black man, LLOYD N. FERGUSON. While the body of a black man could not enter their front door, the mind of a black man was influencing some of their most creative minds. Ferguson is now head of the chemistry department of the California State College at Los Angeles.

Some other names of note include, MODDIE D. TAYLOR, head, chemistry department, and first black man to win the coveted MCA Award, CLYDE R. DILLARD, associate Dean, Brooklyn College and co-author of an outstanding freshman text, HAROLD DELANEY, Associate Dean for all sciences in the SUNY system, LEWIS A. GIST, associate program director, National Science Foundation, GERALD A. EDWARDS, associate program director, National Science Foundation, CHARLES PRATT, first black staff member, ACS, and JOHN HODGE, highest ranking black chemist in the government regional laboratories.

In my last slide, I wish to list some men holding positions in industry with biological significance. The first person named is JAMES H. BIRNIE, director of Endocrinology research for Smith, Kline and French, a large drug firm in Philadelphia. Birnie, a honor graduate of Syracuse University, was formerly a professor at Morehouse College. A second scientist of note is LINCOLN HAWKINS, recently promoted to section leader for plastics research at Bell Telephone Laboratories in New Jersey. The third person of note is Dr. HAYWARD CAMPBELL, JR., a bacteriologist, who is director of biological and microbiological research at the Indianapolis laboratories of the Eli Lilly Co. The chief engineer of the Scientific Instrumentation Division of the Forgflo Corporation, who designed the only American-made electron microscope is Dr. JOHN W. COLEMAN, a noted biophysicist. The director of the Stapelel Laboratory at Jeanes Hospital in Philadelphia, and one of the outstanding scientists involved with the protein-bound iodine test (PBI) is WILLIAM C. FOSTER. Finally, the senior research chemist with the Allied Chemical Corporation is Dr. FRANK R. PRINCE, a native of St. Thomas in the Virgin Islands, and a graduate of Brooklyn Polytechnic Institute with a doctorate in Organic Chemistry.

I hope that I have shared with you some of the contributions of black scientists. In such a presentation as this, there are bound to be some very important persons who are ommitted. For example, I mentioned none of you here. And if you feel badly because I didn't mention the second most important black scientist, you, don't forget I didn't say anything about the most important black scientist either.

JACQUELINE J. JACKSON, associate professor of Medical Sociology at Duke University Medical Center, holds a Doctor of Philosophy Degree from Ohio State University. With a rich background of research and scholarship in Sociology, Gerontology, and Human Development, Dr. Jackson has taught in many black colleges and universities and has published in many scientific and educational journals. She is a member of the Editorial Boards of several scientific journals and holds membership in many professional associations. She is active in many national organizations, including National Caucus on the Black Aged, of which she is the Secretary, and the Advisory Council on Aging and Aged Blacks to the U. S. Senate Special Committee on Aging.

RACE: SOCIAL IMPLICATIONS FOR THE LIFE SCIENCES

Jacqueline J. Jackson

The major focus of "Race: Social Implications for the Life Sciences" is upon a sociological analysis of selected social implications of race relative to the Life Sciences curricula in the predominantly black colleges represented by those of you who are members of this Life Sciences Project of the Six Institutions' Consortium. Such a focus may be useful for any number of reasons, and especially in light of the increasing convergence among various disciplines on your campuses. Much of those attempts at convergence may be attributed directly, no doubt, to your efforts to enlarge considerably your students knowledge of and understanding about themselves and others as bio-social-psychological beings. Certainly greater emphasis upon a better understanding of group interaction, including its social and physiological components, is much needed. Since, in black colleges especially, a consideration of the social implications of race is quite important, we can well examine selected aspects of race extant on our black campuses and identify certain knowledge gaps where the life sciences, in particular, could provide assistance in reducing those gaps. Hence my specific focus, albeit limited, is upon selected aspects of race possessing social implications for the life sciences. Further discussion of the points I shall cover, as well as additional points you may wish to raise, may take place in greater detail in our group discussion this afternoon.

The expressions "I just want to be a human being" or "I just want to be treated as a human being" are probably common on your campuses. Such expressions suggest an abhorrence of racial classifications. They also suggest a desire to be identified only as "human beings." The life sciences at the black colleges can aid in the analysis and interpretation of such expressions. For example, they can point up the fact that a realistic conception of human beings must recognize human differences.

Most evolutionists, who now regard Africa as the "cradle of mankind," inform us that various races of modern men probably emerged between 40,000 and 8,000 B.C. At that time there were few, if any, critical differences in the cultures of various subgroups of mankind. Since then biological differences have probably been far less important and cultural differences far more important. While the traditionally employed racial classifications have appeared to rely heavily upon biological differences, they have undoubtedly been heavily influenced by culture. That is, racial classifications have been heavily dependent upon idiographic factors of the classifiers themselves.

We are all aware of the usual phenotypical traits commonly employed in the traditional classifications by race, such as those of skin color, hair texture, degree of prognathism, and height. We need not deny such apparent differences. Even among black Americans we are well aware of the phenotypical variations, such as those again of skin color, hair texture, degree of prognathism, and height. From a social standpoint, we must consider the significances attached to those differences. For example, differences in skin color are most significant in the United States because of the differential evaluations attached to skin color. In general, the lighter the skin color the greater the social valuation or attached superiority, and, conversely, the darker the skin color the greater the degree of attached inferiority. Skin color, of course, is not the determinant, but it is one of the highly visible phenotypical traits currently employed in making a social assessment of an individual.

Nevertheless, considerable overlapping of phenotypical traits does occur, making it quite difficult, on occasion, to label persons easily, as exhibited by the phenomenon of "passing" among blacks. From a biological standpoint it may be useful to define a racial group as one composed of persons sharing a common genetic pool. It may even be useful to employ such a definition in classifying black Americans,

provided that we obtain a meaningful racial classification of the various subgroups found among black Americans. Clearly, all of us who are socially classified as black Americans do not share a common genetic pool. Whatever the biological implications of that inference may be, it is still important to reiterate the fact that any biological classifications of the various subgroups among black Americans, we as social scientists, have failed to provide you with any meaningful, systematic schemata of social classifications among black Americans. Its need may be quite acute.

Now, if it is the case that biological and social differences do exist between various racial gropings, such as in the case of blacks and white, as well as among blacks, it is then important to have our students recognize those differences and their implications. We must recognize that we are not "just human beings." We must not deny reality by asserting that we are "just human beings". We must question the nature of the self-identity concept of those who persist in asserting that they just want to be "human beings". Our students must be aided in developing more positive self-identities that extend beyond the mere rehetoric expressed in such statements as "Black is beautiful." More realistic self-concepts are indeed necessary for one must understand one's self in terms of one's group memberships. In considering the gaps, if any, between one's group memberships and one's reference groups, one can then make decisions about the action, if any, one may wish to engage in in order to reduce the gaps, if any between the group memberships and the reference groups. That reality which is viewed as undesirable can be changed through individual and collective action. Presently needless energy is wasted in dodging reality, in failing to recognize the fact that we all are not "just human beings."

Specific illustrations of what I have in mind may be helpful. Let us consider differences in life expectancies. Both racial and sexual differences are quite apparent. White women tend to outlive black women. White men tend to outlive black men. Women

of both groups tend to outlive men of both groups. Infant mortality among blacks in the United States is significantly higher than that among whites. We need more information about biological and social factors contributing to longevity. We also need considerably more information about Dr. Robert Kastenbaum, a psychologist at the Wayne State University, Detroit, Michigan, has referred to as premature aging and death among minority groups.

Dr. Kastenbaum has indicated especially that minority groups appear to be particularly vulnerable to such premature aging and death. Minority group males are more victimized by these processes than are minority group females. Perhaps genetics is a factor. Genetic differences between subgroups among black Americans, for example, could produce differential vulnerabilities to the possibilities of premature aging and death. Certainly social factors play a significant role, as can be seen in differential access to adequate nutrition and other living conditions. In any case, greater identification of these vulnerabilities among blacks, and especially among black males, could be quite beneficial.

We should also be concerned about the recurring issue of eugenics. Should further control be established over who breeds with whom to produce whom? If so, we must know who will plan breeding patterns among blacks and, more important, who will plan the planners. We must be concerned about other efforts to limit the black population, but we must also be concerned about those who do not favor the practice of birth control among blacks. We know that, in general, fertility rates among blacks are inversely related to social class variables. That is, the higher the educational, occupation, and income levels, the lower the fertility rates. We also know that, in comparing black and white women who have completed college, the fertility rates are higher among the latter than the former. We must be especially concerned about the implications of lower reproductive rates among those blacks who are considered our leading intellectuals, entertainers, scientists, et cetera, and about the higher reproductive rates among those

who are less likely to be able to provide adequately for their offspring in ways designed to nurture some degree of independence in individual and social functioning. We must also be concerned about the effects of lack of appropriate spacing between children upon their physiological and social development, including the extent to which opportunities may be available to them within their environments to participate adequately in educational and other processes helpful in achieving a relative degree of adult autonomy. In general, then, I am suggesting that the life sciences at the black colleges could help provide us with more information about the important issues of eugenics and of birth control. Such information can be applied in any number of beneficial ways. Such information is especially needed today in light of the extreme stands taken on these issues by the leading molders of public opinion among blacks.

A collorary of the issue of "I just want to be a human being" is that of "total unity". A number of exponents of "total unity" among black Americans fail, in my judgment, to consider adequately the various social patterns and processes operating among black Americans. They fail to realize that social stratification, despite our ability to conceptualize it precisely, is a reality among black Americans, that the social heritages of black Americans show variations. From a social standpoint, some black Americans are even classified as socially superior or socially inferior to other black Americans. The life sciences have accumulated a considerable amount of information about such variables as stratification, aggression, and the effects of overcrowding among lower animals, such as those of monkeys and rats. Some of that information is applicable, with appropriate modification, to humans.

In his introductory remarks at a seminar, Dr. Prezell Robinson, (President, St. Augustine's College, Raleigh, North Carolina) indicated that overcrowded conditions among humans can produce undesired behavioral effects such as poor learning. Life scientists at the black colleges, in collaboration with their social science colleagues, could provide much needed

information and action concerning desirable public housing designs, especially since many of the tenants are likely to be black. That is only one illustration. Some information from the life sciences about the "pecking order" could aid our analyses of such phenomena as leadership conflicts among various black protest groups, as well as within such groups, as in the Southern Christian Leadership Conference.

The life scientists at the black colleges could consider quite seriously the implications of the "astrology" issue raised recently by I. Robinson, of the New York Board of Education. The real issue I think he raised is quite critical: namely, the various types of "fits" between teachers and pupils within the school systems. For example, what do we know about diurnal patterns among blacks? I believe that there are "day" people and "night" people among blacks. These physiological differences could well produce differential physiological functioning which may, in turn, affect various forms of social development and adjustment. No doubt, social factors, including the employment patterns of family members and their sleeping arrangements, affect the extent to which various blacks function better as "day" or as "night" people. If such an assumption has any validity, further exploration of that validity is certainly crucial. Then some application of the findings would definitely be in order. For example, we could well engage in a study of the effects of opening public schools on "farming" hours rather than having staggered hours for opening various schools within a system in a given locality so that those who are both "day" and "night" persons may have greater access to resources. As it is, those who are "day" people benefit most from the current patterns of school hours. Those who are "night" people are punished.

Black scientists and social scientists could be in the classrooms where there are black pupils collecting vital data for us right now. They could determine, e.g. if the common notion that many black students have short attention spans may be due at least partially to differential diurnal patterns or biological timeclocks. We,

ourselves, too often adhere to the cultural norm that "early to bed and early to rise makes a man healthy, wealthy, and wise." Untold millions of blacks have been and are rising early and they are not yet wealthy, nor are they likely to become wealthy! We, ourselves, must accumulate sufficient knowledge and become advocates of desirable social policies in line with our own needs. We must advocate, at the very least, social policies convenient for our physiological differences in the educational spheres, following, perhaps, similar patterns established in industries where some persons engage in day employment and others in night employment.

As you know, the phenomenon of sleep has received increasing research attention in recent years. Life scientists at the black institutions could well focus some attention upon sleep, and particularly upon dreaming. Questions in need of further investigation include such ones as "Do blacks dream fantastically?" or, as Dr. Kastenbaum has phrased it, "Do blacks do their homework while asleep?" Available data from the National Center for Health Statistics suggest that, in comparison with whites and black females, black males report proportionately more nightmares. Can you provide us with greater information about interactions between nightmares and physiological functioning? Can we in the social sciences provide you with more information about interactive processes between nightmares and social functioning? If so, we may contribute towards a greater understanding of the phenomenon of premature aging and death among black males.

Another area of especial concern to me relates to the usual explorations of the common causes of death among Americans. Specifically, what I most miss in such explorations of mortality, as well as those of morbidity, is sufficient attention to racial differences. For example, while coronary heart disease may be a leading cause of death in the United States, the death rate from hypertensive heart disease appears to be greater among blacks. Yet, much more research and treatment attention is focused upon coronary. Blacks themselves must become more actively involved in exploring those

conditions contributing heavily towards their own mortality and morbidity. For example, you and your students could aim immesaurably in enlarging our knowledge about hypertension among blacks. You could also aid in providing us with greater information about arthritis. As you know, arthritis is more prevalent among blacks than whites, and especially so among black females, and it appears to be inversely related to social class. If it could be partially attributed to such factors as mopping floors and pushing brooms (i.e.,correlated with occupation), then one application of knowledge in this area could certainly be greater support for those attempting to unionize domestic workers. Clearly they need adequate hospitalization and other fringe benefits commonly accruing to professionals. If arthritis is more prevalent among blacks, that could be a factor contributing towards greater reported presence of disability days among blacks than among whites. It may mean slower recovery, thereby, requiring a greater proportion of paid "sick" days within hospitalization, including allocation for illness at home. In short, data accumulated by us and our students could help activate us to push for needed changes in health insurance coverages characteristic for most blacks, and particularly for those engaged in unskilled and skilled occupations.

Sickle-cell anemia is the latest "in" thing. Most of you, no doubt, support the recent thrust to enlarge considerably research and other funds for sickle-cell anemia. Yet an exceptionally qualified black physician, Dr. Nathaniel Calloway, of Madison, Wisconsin, with whom I spoke as I was preparing this presentation for you, indicated to me that one should consider quite carefully the various implications of the recent "hullabaloo" surrounding sickle-cell anemia. That is not to assert that victims of sickle-cell anemia should not receive adequate medical attention, nor that needed research designed to deal with the phenomenon should be curtailed. However, he was quite concerned that the recent, massive attention being given to sickle-cell anemia could be another "racist" trick to play up "black disability" or "bad black blood." Approximately 10 percent of black Americans probably carry

the trait for sickle-cell anemia. That proportion may yet be declining or it may have stabilized. Certainly, contrary to some indications in the mass media, the vast majority of black Americans are not subjected to sickle-cell anemia. Thus, we must aid in the appropriate handling of this phenomenon among blacks. Such handling would involve not only our black life and social scientists, but also our black mass media specialists.

For those of you in the Life Sciences, sickle-cell anemia represents an opportunity to do your home-work in your laboratories as well as in your dreams! Those of us in the Social sciences should also be concerned with the various beneficiaries of the recent upsurge of interest in and funding for sickle-cell anemia. Previous experiences suggest that an undue number of persons, generally white, not otherwise interested in many phenomena almost uniquely related to blacks become quite interested when the money is right. For example, following the greater availability of funds for mental health among the disadvantaged, it was interesting to note changes in those mental health therapists who found blacks, previously unsuited for, suitable for therapy. To be sure, greater emphasis was placed on group therapy for them than upon psychotherapy, but even that event could be explained in part by economic, rather than by other factors.

I wanted to mention intelligence merely to make one cogent point about black manpower. The recent article by Jensen and the controversey it created is a good case in point. While Jensen attacked heavily the types of intellectual capacities which blacks may have, some of the problems we have had in criticizing his work can be attributed to our general lack of sufficient supply of blacks well trained in genetics who can "wheel and deal" with Jensen! The simple point is that you in the life sciences would contribute greatly by providing us with more black geneticists, more black students of brain physiology, et cetera. You must provide us with more "original" thinkers, with fewer who merely parrot knowledge

and you must include more black females among those professional groups. We need more "chi-squarers." That is, those who think and act "chi-square to chi-square".

Let me draw upon a personal experience to illustrate what I mean by "chi-square to chi-square." In 1968, I proposed that the minimum age for eligibility requirements for beneficiaries of Old-Age, Survivors, Dependents, and Health Insurance (OASDHI) under the provisions of the Social Security Act of 1935 and its subsequent amendments, should be reduced for blacks so as to reflect the existing racial differences in life expectancies. Such a change would have the net effect of equalizing the approximate number of years of primary beneficiary status for both blacks and whites. It would certainly reduce considerable extant racial inequities. As you know, the Social Security Administration has never standardized average age requirements upon a black population. Since that time I have modified that proposal. In addition, both the National Caucus on the Black Aged and the Advisory Council on Aging and Aged Blacks to the U.S. Senate Special Committee on Aging, both of which are chaired by Hobart C. Jackson (Administrators, Stephen Smith Geriatric Center, Philadelphia, Pennsylvania), have adopted that proposal in an effort to initiate favorable action on it. In general, that proposal recognizes the differences in life expectancies by race.

More specifically, that proposal is based upon the fact that (a) blacks tend to die earlier than whites; (b) blacks tend to define themselves as being older at an earlier chronological point in time than do whites; and (c) black males, at least, may age faster in body age than white males, as pointed out by Robert Morgan in his 1968 article in the Journal of Perceptual and Motor Skills. Morgan hypothesized that based upon his investigation of adult males, black males tended to age faster in body age, as already indicated, so that, by the time a black male was about 60 years old, he had the body of a 69-year old white male. Hence, it makes sense to indicate that blacks, and black males especially, should be eligible for their earned benefits at an earlier age so as to be able to draw equitably upon OASDHI. This also makes sense in terms of current employment and retirement

patterns among blacks and whites. Consequently, if white males are eligible, as primary beneficiaries for OASDHI at the age of 65 years, then black males should be eligible at the age of 57 years, since, on the average, they tend to die about eight years earlier than white males. Further support for such a proposal could come if you in the life sciences at the black institutions provided us with additional data about, once again, premature aging and death among blacks.

Now, what about "chi-square to chi-square?" In trying to obtain additional support for this "Social Security proposal," we have encountered individuals who have questioned the validity of the assumptions upon which it is based as well as those who have raised such red herrings as the typical one of "But what about the women?" Recently, three representations from the Social Security Administration honored a request made by the Honorable Frank Church, Chairman, U.S. Senate Special Committee on Aging, and appeared before the aforementioned Advisory Council on Aging and Aged Blacks to deliberate with us about the proposal. One of those three persons attempted to point out to us her opposition to the proposal by indicating that blacks actually benefitted inasmuch as lower-income persons receive proportionatley more benefits as recipients than did higher-income persons. Consequently they were actually advantaged. Because we could, in this instance deal "chi-square to chi-square", we quickly noted that we doubted the feasibility of employing such an erroneous--or partially true--argument, inasmuch as we well knew what had not been pointed out: namely, lower-income persons, including blacks, also pay in proportionately more of their earnings to Social Security during their employed, covered years than do those of higher income. We were aware of some of the data published by the Social Security Administration which actually provided us with that type of information.

In closing, may I provide a summary of what I have said and end by informing you anew of the special summer program for premedical students from black institutions at Duke University. Insofar as the social implications

of race for the life sciences are concerned, I have tried to emphasize that, as you well know, race is yet important, at least from a social standpoint, and that those of you in the life sciences could aid your students in understanding the realities of race. There are important areas of linkages between the life and the social sciences, and those linkages extend to basic and applied research and social action, such as in the areas of premature aging and death, various factors related to mortality and morbidity among blacks, sleep and dreams, and interactions between physiology and education. You and your students can continue to contribute towards enlarging our much needed knowledge pool, not the least of which would include more development of black--female and male--scientists, such as geneticists. The knowledge accumulated in various areas can be employed effectively as all of us assist in the important process of helping to change those social policies adversely affecting us and helping to form more viable social policies, such as in the area of eugenics and birth control.

Insofar as the special premedical program is concerned, Dr. Morton Lieberman, Department of Psychology, Duke University Medical Center, Durham, North Carolina, requested that I mention to you the fact that the program will be in its third year in the summer of 1972, and that some of your students might be interested in participating. Some students from some of your institutions such as Bennett College, I believe, have already participated during the previous two summers. In any case, there have been some changes made in that program. It is designed for students interested in becoming medical physicians who have completed their junior year of college at a black institution in the South, including Washington, D.C. The student should be recommended by a faculty member at his institution and his application should be forwarded to Dr. Lieberman. This program is not perfect and Dr. W.W. Johnson (St. Augustine's College, Raleigh, North Carolina) has been especially concerned, I think about the significant flaw wherein the participants, who receive stipends from their respective institutions, fail to

receive equivalent stipends during their weeks of participation within the program. Insofar as I know, the disparity in stipends yet exists, but it can be accounted for by differences in stipends in the work-study programs at the various black institutions.

In any case, during the past several years, I think that you would be impressed by the proportion of participants in the program who have been admitted to a medical school, largely at Duke or at the University of North Carolina. The program does exist. It has been successful in aiding its participants in entering medical school and it seeks applicants for 1972. Therefore, I hope that you will inform your students of this program and urge those who are eligible and interested to apply with your assistance. You should write directly to Dr. Lieberman at the Department of Physiology at Duke. Finally, and in this connection, those of you who are in the life sciences at the black institutions should be especially interested in this program or in any other program designed to increase the number of black medical physicians inasmuch as, historically, our black physicians have come overwhelmingly from the types of institutions represented by you.

DOROTHY WILLIAMS, Director, Program Development Division in the Office of Community Planning and Management of the U.S. Department of Housing and Urban Development, is a former distinguished progessor of Sociology at Shaw University. She comes to us with a rich background of research and scholarship in Urban Sociology and Ecology, Race Relations, Sociological Theory and Social Problems. She received the Doctor of Philosophy degree from the University of Southern California. Her doctoral dissertation was entitled "Ecology of Negro Communities in Los Angeles County, 1940-1959." Published in 1961, it is still cited today for its accurate prediction of rioting (as exemplified in the Watts section of Los Angeles in 1965.) She is a member of the North Carolina Sociological Association, and has numerous published research reports and papers to her credit.

THE ECOLOGY OF HUMAN RELATIONSHIPS

Dorothy S. Williams

It is not without significance that we, the educated, the youth, and the future leaders and citizens of the tomorrow's world, have gathered here today to address ourselves to one of the most pressing problems of our time. Most of us are familiar with the emphasis which is being placed upon the ecological disaster which confronts us, begging for immediate decision and actions. But, some of us have not stopped to ponder what deterimental effects it would be to have clean air and clean water but polluted thoughtways. It is this aspect of ecology which I propose to discuss. While each one of us here is interested in clean air and clean water, the necessity for improving the total environment demands our attention and action.

When we talk about the relations of organisms to their environment we think more of the biotic community. Many biologists do not include, in the total environment, the area of human interactions. Around 1920, some of the social scientists decided that maybe what they should do was to borrow from the natural sciences the ecological concept. They set up their own branch of Ecology called Human Ecology. Mostly, Robert Park and the Chicago University sociologists have spent some time, energy and effort in this area. The concept system was set up and the whole gamut of all the ecological processes utilized. The biological concept of competition was applied to the human situation. Various analyses of what happens when man attempts to make arrangements for living space resulted. Some of the results can be seen today as we observe some of these patterns of living. The processes are called centralization, concentration, segregation, resegregation, invasion and migration, to name a few. All concepts referred to the location of people, businesses, business organizations, as well as, economic activities in one focal spot. The concentration of business was called the central business

district. Decentralization meant the movement of the population and economic activities to the periphery of the city. But the terms which come out of this whole ecological focus so meaningfully are the concepts of segregation, invasion, and succession. These have to do with the kinds of special arrangements that were made for people to live in certain sections of the city. When trying to decide whether ecology belonged in the social sciences, a debate ensued as to whether these ecological processes were in fact sociological or social. Whatever the end result of this discussion was, it was concluded that where a man lives in space has a lot to do with the kinds of social relationships he establishes with his fellow man. If we move through this workshop by concentrating on the ghetto, we can understand what it means to be limited and restricted in space. These are just a few of the ecological questions which emanate from the ecological approach.

The term, human relationship is concerned with interaction which has to do with person to person, person to group, group to group, group to community, or community to society. Whether considering ecology from the biological point of view, or from the social scientist point of view, the human interaction should be included. Human relations, having to do with interaction and contact, are important in improving the quality of life. What do you do and how do you develop an understanding and awareness at a time when most people are discussing ecological decisions and ecological disasters?

What I see today as my major approach in discussing the topic "Ecology of Human Relations", is to somehow look at what I call the organic functioning of togetherness - the togetherness of human relations. Herbert Spencer compared this kind of human solidarity or what he called togetherness in terms of men, when he talked about a guardian in the midst of a jungle. He said that mankind must keep these unorganized and ungrouped facts of existence from taking over his garden. Spencer somehow saw this human situation, or if you want to call it civilization, as a kind of garden

in the jungle of man in terms of man's inhumanity to man. And this is what the ecology of human relationships is all about. This is what Alfred Whitehead was talking about when he said, "togetherness is a social nectar". This means that in a natural world, there are forces that would destroy man's physical, ecological setting, which he would create and for which he would be responsible.

What I am saying to you is that in the social world and in the natural world there are pollutants. These pollutants are responsible for that which is playing havoc with man's togetherness at this particular time. These items truly pollute! They arrive like an insidious social fog and they blur the atmosphere. Somehow they cause man to have relationships which hinder his full capacity from blooming when he attempts to interact with his fellow man. I'm talking about social contamination which keeps mankind from being able to realize what life really intended for him. People, in the biological and ecological area, talk about those things which keep man from being able to enjoy the present state of his biotic being. Here we are concerned about all of those social pollutants which are keeping mankind from realizing his fullest capacity and keep him from living to his fullest worth as a human.

We could take anyone of the pollutants, for example, prejudice. Let's substitute prejudice for anyone of the simple biological physical pollutants which we have today. Let us see how it blocks mankind in terms of how it keeps each individual in this society from developing to his fullest capacity. I was talking to a friend of mine about this topic and when he thought about it, he said that one of the things that we must do is analyze the impact of these pollutants in terms of the Black community in order to make it more realistic from an ecological standpoint. Let us take the state of New Jersey or for that matter any other state in the union. How does a man find out where the Black community is located in terms of certain other ecological features? At one time, it was easy to designate the

Black community by the railroad track. The ecology, the location, the special arrangement, and the kinds of ecological disadvantages go into decisions under which people must live, grow and develop. I haven't tested it out but I think today it would be easy to look at the location of the Black community in terms of noise pollution.

I would like to see some of you who are in sociology take a look at the location of the community in terms of highways. These highways separate the affluent society from the ghetto. I had a teacher in psychology, who doesn't call the word ghetto, but he calls it "get your toe." And some of us laughed at him. But, you know when we think about it there is something serious about this. The ghetto will not only get your toe it will get your soul. I don't know how sensitive you are to where people live in space. But, if I ever feel that I need to be sensitized, I would go for a walk in the slum area of any community. With my belief in ecology and the fact that all things are related, I understand why it is that a child who grows up in a harsh environment turns out to be just as pricklish as the kinds of plant that grows up in the desert.

It is not enough for us to sit here and discuss these ecological connotations without taking into consideration the meaning that they have for each one of us as we express our concern about saving the polluted environment. Think about what is going on on the continents of Asia, Africa, North America and think of the loss and waste of human resources because some of the same kind of attitudes that are responsible for the disastrous situation that we have in the physical environment have played havoc with our minds when we begin making decisions as to what is going to happen to the lives of people in their social environment. These are ecological decisions that must be taken into consideration.

The second thing, in terms of the social pollutant that we are now calling prejudice, is that of distortion or perceptual awareness. I don't know

what the traffic jam is here in the city of Greensboro anymore at the busiest hour of the day. But I've got a very good idea what it is like in Washington D. C. When I see the incoming traffic in the morning, bumper to bumper for about two or three miles and I then see this same traffic going out in the afternoon, I can understand why there is not the kind of perceptional awareness that should exist in the field of human relations. We are separated in space; we are separated in social contact. We are separated when it comes to making decisions that affect the lives of each and every citizen in the country. It may be that the biological impact of ecology will teach us that smog crosses all kinds of geographical lines and social pollutants of all kinds do the same. Try as we may, we can't keep them in Washington, D.C.; they move out to the periphery. In fact, they move out for a world kind of distribution. I think that this is significant.

Not long ago, I attended a beautiful workshop. We did role playing. We had a black man playing the role of a white man and a white man to play the role of a black man. can you guess what happened in a situation like this? The black man could play the role of the white man but the white man, much to his amazement, was unable to play the role of the black man. What sticks out in my mind from that workshop was the honesty with which this white man confronted his situation. His limited perception, his inability to emphasize, to understand the black man.

One of my co-workers said to me, "You know, Dorothy, I never really thought about this thing. I come here to Housing and Urban Development every morning and I work with Blacks. I leave at the end of the day. But, I have never had any additional contact that would cause me to relate in a meaningful way to black people" We are talking about perceptual awareness, we are talking about the relationship of the organism to its total environment. A little bit later we are going to discuss the web of life - one of the key concepts in the whole ecological approach. I mentioned Spencer a while ago and said that he considered

civilization like a garden in the midst of a jungle. You know, Spencer also said, in terms of this garden, that we must take time to cultivate it, in order to see that all of the plants there have an opportunity for survival. Can we apply this to the human relations field? Can we talk about a need that we have to think about, to relate to, to be concerned about, to understand, to be involved in, and to be committed to the problems of each individual, to each group, and to each community? We should, because we are just that close together. The smog has no geographical boundaries, crimes have no geographical boundaries, drugs have no geographical boundaries; and we are no safer than our brother.

I mentioned a few minutes ago the web-of-life concept in ecology. The closest I could get in my mind to trying to picture what it is that is involved in this web, is a spider. What I did was try to visualize this spider in his web. You know how it looks. You've seen it. It crosses at angles, horizontal lines, perpendicular lines. Suddenly I was stunned, because I found that this lowest biological creature could get a kind of artistic pattern out of what he was doing. I wondered why it is that man can't design a similar artistic design of his relationships with mankind. Considering all the angles, all the positions, and all the relationships, whether they be horizontal or whether they be perpendicular. Can he make out of it something that is just as creative as what the spider does? To me this is what the ecologist means when he talks about the web of life. You know the concept. I decided not to spend time talking about the concept in terms of theoretical definition because I know you can go to anyone of the magazines, textbooks and get any of the definitions. We need to talk about the practical application of a spider's web where there is interdependence, where there is interrelationship of all lines, and where there is a design for the survival of mankind. We are talking about an interdependency. That is what ecology is all about as it is applied to the physical environment and to the social environment.

I don't know how we are going to get students, scholars, educators and biologists to be as concerned about the urban environment, as they are about the physical environment. The books today tell us that high rise apartment buildings are no good for living. That clustered and concentrated conditions in the city might make for a degree of comfortable living but they do not make the biological animal happy and wholesome. This might suggest a research topic to some students. It doesn't make any difference of what the discipline. Take a look at this urban environment to see what the impact of these big buildings, which I am told attract so much energy by day and exudes a kind of dampness by night, has upon the human animal. What impact does this kind of structure, other kinds of structures and buildings have upon the biological individual? What does it mean to have an absence of a sufficient amount of plant life? You are to be some what concerned about this because most of us are concentrated in the urban environment. Everybody ought to be somewhat concerned about this because this country is becoming more and more urbanized each year. There is a biotic, symbiotic, interdependent web of life even though it might be latent. There is one thing that mankind has not learned yet and that is that we must follow nature's rules. Any alteration in nature's plan will have some consequences which in turn will have additional consequences.

There are a few urban colleges which are now looking at the consequential nature of the urban environment. They are looking at starvation, stress, and strain. There are a few biologists who are talking about the effect of concentration of population on reproduction. Many studies have been conducted within concentration camps to find out what happends to the human animal when he is put in an environment that is not natural for his being. What does it do to the human animal to give him all the comforts and pleasures of the technological revolution when deep within himself he has the need to relate to the flowers, the birds, the bees, the mountains and the oceans? Many of the architects and engineers who are designing our cities have completely forgotten about the psychic

needs of the individual. Using the analogy of the spider web, do you think that mankind at this particular point in time can find the web of his interrelatedness with other men? I am asking you to place in the garbage all these exotic distortions which pollute man's mind and keep him from relating to other men fully and meaningfully. They blur his vision. They clog his machinery and cause him not to be able to think and not to be able to feel. This to me is the ecology of human relations.

I often tell a story about the blind man, and here today I see this man in a different manner. I think man is blinded but not physically blinded this time. He might have on dark glasses but I am not sure that some of his blindness is not due to some of his needs that have been fulfilled in his environment, and I am not talking about his physical environment. I am talking about the need to know that he can be and that he can enjoy life and that he must not continuously involve himself at an almost superhuman level in the struggle of existence which originated with the ecological terminology in the beginning. Can you imagine a blind man, physically blind, but yet able to identify his total being with that of other mankind and able to relate? Again I would like to reiterate that in ecology we speak about man's conquest of nature. In ecology, we must also speak of man's conquest of mankind - not only what he has done to his physical environment but what he has done to his social world. We are so dependent on our physical environment. We are so dependent on each other. Our dependency and our survival do not say again that nature must obey us, but our dependency and our survival say that we must obey nature. This is just as true in the physical world as it is in the social world. This is just as true in the social world as it is in the physical world. We need a democratic tolerance of people and problems. We need to understand that there is a greatness in humanity. In order to develop the right kind of environment, we must transcend any type of divisiveness regardless of the justifications and the rationalizations for their existence. Also, we need a pluralistic

survival. There is no doubt about it. You belong to me and I belong to you. We are interrelated, we are in this thing together. We have got to try to build some kind of solidarity. Those of you, who are in Biology, must go back and look at patterns of survival which plants and animals have for themselves. You will probably want to read, and almost any social scientist would enjoy reading, of all the animals and plants that are in existence. You might want to know why it is that those that did not survive were not successful. This is nature's picture.

What happens on a human level gives you two challenges. One is work. As I said at the beginning, I thought very, very hard about giving you the academic side of the ecological approach to the physical environment, and to man's world. Fact upon fact would not have been able to take out of the book a pattern of survival being met by knowledge - some knowledge, grounded knowledge, documented knoweldge, yet a great deal of action, knowledge and action. You know I am told that these two guys, knowledge and action, had quite a discussion. They would not decide which one was the most important. Knowledge said "Get all of the knowledge that you can." Action said, "Do all that you can." Neither fully equipped. And one day they met. They found out that they needed each other. That they were interdependent. In this relationship they both became equally free.

There is one poem that I have always read, and I liked very much. You all know it because it is such an old favorite. It says:

No man is an island unto himself.
Each man is a part of the mainland.
One clod of the shores of England diminishes me.
For I am involved in mankind.
Learn not to say therefore.
For whom the bell tolls;
It tolls for thee.

Interrelatedness, interdependence, patterns of survival, work, action - this, to me, is the quality of life. This, to me, is the ecology of human relationships!

DAVID T. RAY, professor of Zoology, Howard University is a well known researcher in the genetics of Mormoniella. Dr. Ray has carried out numerous research studies at the Marine Biological Laboratory, Woods Hole, Massachusetts. He has also directed a series of researches, funded by the National Institute of Health and the Atomic Energy Commission. He has numerous research publications and distinguished teaching experience in Genetics and Physiology at Johnson C. Smith University and Howard University. A graduate of Bates College, Dr. Ray received his Doctor of Philosophy degree from the University of Pennsylvania in 1955. He is a member of the Genetics Society of America; American Genetics Association; American Society of Zoologists; National Institute of Biological Science. The past National President of the Beta Kappa Chi Scientific Society (1968-70), Dr. Ray was also President of the Society of Sigma Xi in 1968 and the Regional Director of the National Institute of Science, 1965-68.

GENETICS OF AFRO-AMERICANS

David T. Ray

It is a pleasure for me to contribute to the Six Institutions' Consortium by talking about something that is very close to my heart. Usually I look over the audience and try to contemplate what they are thinking. This time it is I who am thinking. This audience could well be my laboratory for the type of speech that I am giving. As we look over this audience we can see the varied complexions that we have among our Afro-Americans. The topic might just as easily be "The Caucasian Genes in Afro-Americans".

Black is our social ideology at the present time; we think a certain way. Genetically, in terms of the skin, or pigment, no one is black just as no one is white. We are a combination of pigments, melanin which is dark brown, red pigment, and yellow pigment. C. L. Davenport the English Geneticist of the 1930's studied Afro-American genes by exposing the individual and comparing him to a color "top". This was a home made top in which he had placed pieces of black, red, yellow and white paper. The white was called a dilution factor. He would put them together, spin them around and the colors would blend. If one would hold the forearm beside this spinning color top, the color could be assimulated by adjusting the amount of each color in the combination. Negroes had a lot of melanin and the Caucasians had only a small amount of melanin. Children of mixed marriage had an intermediate amount. Children of the mixed offspring showed variations in between the two original parents. Ordinarily genes are discontinuous or demonstrate wide variations between them. Davenport proposed the continuous gene. These genes are many and varied and combine to give a total phenotype or total look. His model calls for two pairs of genes which as we know will give sixteen combinations. If compared

phenotypically these would give only five different phenotypes.

AABB x aabb
AaBb

AABB	1	Black	This represents a simple Mendelian cross of two pairs of genes. The F_1 cross would give us several genotypes but because of the cumulative gene action only five different combinations would be realized.
AaBB	2	Dark Brown	
AABb	2	Dark Brown	
AaBb	4	Medium Brown	
AAbb	1	Medium Brown	
aaBB	1	Medium Brown	
Aabb	2	Light Brown	
aaBb	2	Light Brown	
aabb	1	White	
	16		

As we gaze around this room we can see many more than five different complexions. This leads us to realize that more than the two pairs of genes were involved.

A more sophisticated study followed this spinning of the top. These studies used the Reflecting Spectrophotomter, a metered light which reflected light from the surface of the skin, usually the upper part of the arm. One study was made in England where the mixing of the races are more recent. Groups of African sailors and students come to England, meet and marry the local English girls, The parents and offspring of the interracial marriages were measured. Some of the offspring (Hybrids) married back to the Africans and some married into the Caucasian group. This sophisticated study gave the same type of results as obtained by Davenport. Eight filters were used in this study and each filter gave a particular reading. (The chart showing the results of this work may be found at the end of the paper).

The eight filters for the Africans gave the "A" type curve and the same filters gave curve "C" for the Caucasians. The Hybrid (F_1) curve was "H" and the "A" and the "C" were backcrosses to the Caucasians and

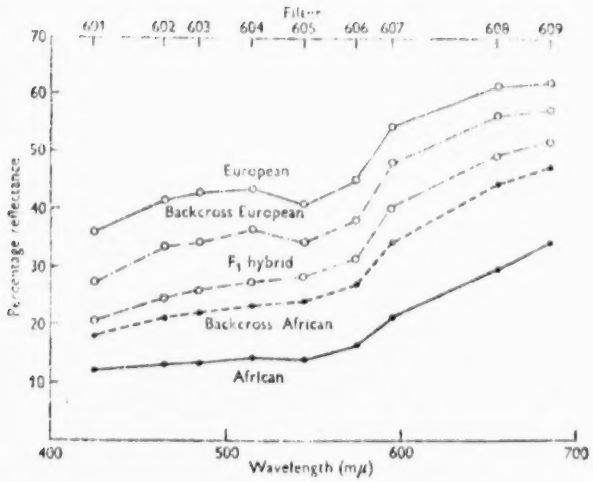


Fig. 1. Mean reflectance curves of European, African and various hybrid groups.

Table 1. Means and standard errors of reflectance values at nine wavelengths of Europeans, West Africans and various hybrid groups

B_E, backcross European B_A, backcross African

Wavelength (mμ)	European		West African		F_1 hybrid		B_E hybrid		B_A hybrid		F_2 hybrid	
	No.	Mean±S.E.	No.	Mean±S.E.	No.	Mean±S.E.	No.	Mean±S.E.	No.	Mean±S.E.	No.	Mean±S.E.
425	103	36.1±0.453	40	12.3±0.484	94	20.8±0.508	30	27.2±1.320	21	18.0±0.915	13	22.2±1.566
465	51	41.6±0.710	40	13.2±0.522	86	24.5±0.572	29	33.5±1.319	18	21.1±1.275	6	28.5±1.962
485	49	43.0±0.668	39	13.4±0.567	85	26.0±0.620	26	34.1±1.371	18	22.1±1.553	6	27.7±2.304
515	46	43.7±0.640	37	14.6±0.680	77	27.4±0.590	14	36.7±2.056	16	23.3±1.685	3	25.7±1.517
545	103	41.0±0.453	40	14.4±0.611	94	28.4±0.581	30	34.7±1.322	21	24.2±1.334	12	30.3±1.483
575	51	45.2±0.526	40	16.6±0.704	86	31.7±0.585	28	38.2±1.206	18	27.2±1.515	6	33.5±1.944
595	51	54.8±0.529	40	21.7±0.834	86	40.5±0.633	29	48.2±1.145	18	34.6±1.699	6	43.7±1.943
655	51	61.7±0.436	40	29.9±1.062	87	49.7±0.586	29	56.7±0.947	18	44.7±1.615	6	53.0±1.789
685	105	62.3±0.342	106	34.7±0.591	94	52.0±0.546	30	57.9±0.926	26	47.8±1.205	14	53.4±1.455

the Africans. One other curve is the "half-way" curve. This shows the exact medium between the African and Caucasian curves. The Hybrid curve is closer to the Caucasian curve than to that of the African. This shows an absence of pure black pigment. (Not explained by the Authors). The spectrophotometer revealed more than the spinning top. It showed variations due to circulation and skin tissue in the skin. Most geneticist have decided that two pairs of genes should be replaced by as many as five or six pairs of genes.

The American Negro (the Afro-American) goes back over two hundred years. Dr. Reed whose work I will refer to later gave the best review that I have seen. About 400,000 slaves were brought to the U.S. between 1700 and 1825. Twenty-five percent came from Nigeria, 25% from Congo and Angola, 15% from Ghana. Ten percent from Ivory Coast and Liberia 5% from Sierra Leone, Guinea and 15% from Senegal and Gambia. Most of these are on the west coast of Africa and they demonstrate a wide difference in their color and body structures. The 400,000 were distributed into Virginia, South Carolina and Georgia. Then came intermarriage in the polite sense or better described as integration after twilight. As a result we have the mixture of the genes. Most people think of the non-African genes as all Caucasian. This is far from true. In Louisiana for example the term Mulatto originated. We have a heavy amount of red pigment. Louisiana is a Sea Port area and the American Indian played an important role in integration in that area. Most Indians are thought of as coming from the West but only the belligerent or Militant Indians were driven West. The wise and peaceful Indians stayed in the East and was caught up in the integration along with the Negro.

Afro-Americans go much deeper than skin color. Just as I have explained about skin color, every other characteristic of the body depends upon different genes. A great many of them are multiple genes as in skin color. The hair texture, which depends on the shape of the hair follicle. If the follicle is round the

hair is straight, oval the hair is curly, and flat the hair is kinky. In Japan there is a gene for hair which is stronger than the Caucasian and African genes. Inter-marriage between the Japanese and either the Caucasian or African would result in hair resembling that of the Japanese.

Variations between the Caucasian and Afro-American is shown in many ways. The shape of the face, the fullness of the lips, and the shape of the nose, are inherited separately and by a great many genes. One can see how complicated these combinations can become. Some very fair individuals have features which are usally associated with the African, while some very dark individuals have features usually associated with the Caucasian population. The randomness of gene action may be considered. We have heard of the variations in the pelvic girdle, and the muscles of the calf of the leg. There is the idea that the Afro-American is flat footed. While there is no definite shape to the instep of the foot, a large number of individuals do show a large muscle supporting a weak instep. This muscle has been the reason given for the great spring that we have in the toes which gives us that extra fraction of a second advantage in running the sprints. Hayes, the great football player for Dallas, Texas, was once known as the fastest human in the world. He has the classic look of the well developed calf and the narrow ankles. The ankles of the Caucasians are larger and the tendon action is not as great. Again, may I point out that all Negroes are not sprinters and show great physical prowess. All of the genes are assorted at random and only the few combinations are ideal. Shokley, the self acclaimed authority on the Afro-American gene, speaks of these physical attributes and he claims that the physical attributes decrease with the mixing of Caucasian genes. On the other hand he claims that the intellectual prowess or I.Q. increases with the number of Caucasian genes mixed with the African genes to form the Afro-American. Science takes a dim view of this idea and he can produce no acceptable data to uphold the same.

Let us discuss next the Caucasian genes which are present in the Afro-American. In most of the literature there is no variation in the description of Caucasian such as I have been giving for the African. Even in charts to be discussed later the Caucasian data has been given as lump data. Lack of variation is taken as given and accepted fact. If we look at the map of Europe and compare just the skin color alone, we see the variation. From the fair skin of the Finns and Danish to the swarthy complexion of the Spanish and Italians. The intermediate Huns of Germany and Austria. The facial features of the Iron Curtain countries as compared to those of the English and on the other hand the Arabs. Afro-American individuals are a mixture of mixtures. Dr. Jerry Hirsch in a Seminar in Psychiatry at the XIXth International Congress of Psychology goes further than I have and says that each individual is different and that the variations are so small between the individuals of a nation or between nations that they awe even the polygene theory.

Monozygotic twins (from one egg) are even different. This difference is caused by environment. Environment and selection can account for the greatest part of variation within races and among races. Leaky, the great anthropologist, claims that man began in Africa. The first skin color was brown. Other authors have contributed that mutations followed. The Caucasian resulted from a mutation which interrupted the metabolic process leading to the formation of melanin. In the hot sun of Africa nature selected against the Caucasian and they would have been in bad shape had it not been for the great movements of the Ice Age. At that time there was the great shift of ice to the south reaching almost to the Torrid Zone. As the Ice receded the colorless individual migrated along with the movement, until they reached the Temperate Zone. Lack of pigment was not a selection factor here and they survived. The Temperate zone was a selecting factor. One had to work all summer to prepare for the winter. In the warm areas one could survive all year with a minimum of technological work. Technology began in the Temperate Zone because of necessity. In the warmer climates like China, Africa and Egypt the emphasis was on culture.

Culture was ahead of technology in these areas although the fact that gun powder was first found in China, shows that they could have excelled in these areas had they felt the necessity for it. Finally, we find that technology controlled all of the money in the world and could buy their culture. We now have a mixture of culture and technology in all of these areas.

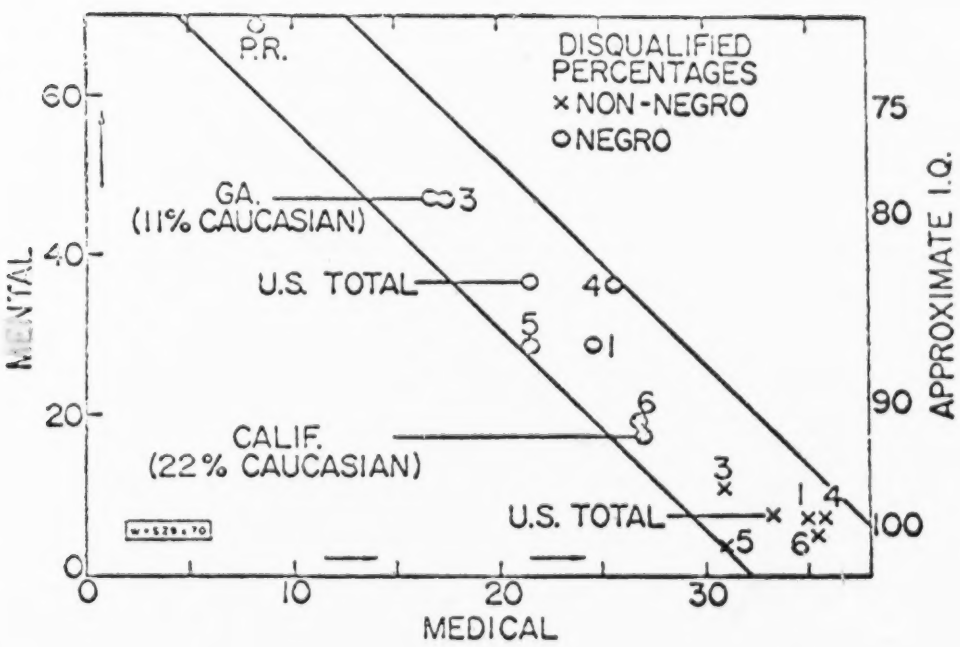
One of the most recent and widely accepted publications on relative numbers of African and Caucasian genes in the Afro-American has been authored by T. E. Reed of the University of Toronto, Canada. His work includes a very good review of all of the literature on this subject. In this work "M" stands for the present proportion of genes at a genetic locus (and, ideally at every other locus too) which are derived from Caucasians in the American Negro. From the formula p+q=1, we select the allele "q" from each group for any gene locus. q^c=Caucasian percentage of genes q^a=African and q^n=American Negro.

$$q^n = M\ q^c + (1-m)\ q^a$$
$$\text{then } M = q^n - q^a / q^c - q^a$$

Genes such as the gene for blood group A of the ABO series or Fy (Duffy's Blood Type) or serum protein GM are used because they either have a "q" which does not vary too much or a "q" which is .00 in the African area. This would shorten the formula to $M = q^n / q^c$.

Reed finds that American Negroes are a mixture of Caucasian and African genes with an "M" of .23 (23%) American Negroes average 23% Caucasian genes. In the review of works of other authors the "M" varied anywhere from .57 (57%) to .07 (7%). The variation was due to the use of other genes than those discussed in Reed's paper. Reed also concluded that the 23% was for Northern Negroes and that the Southern Negroes averaged only 11%.

This was an unbiased conclusion by Reed and he gave environment as probably the difference between


P.R.
DISQUALIFIED PERCENTAGES
× NON-NEGRO
○ NEGRO
GA. (11% CAUCASIAN)
U.S. TOTAL
CALIF. (22% CAUCASIAN)
U.S. TOTAL
MENTAL
APPROXIMATE I.Q.
MEDICAL
0
10
20
30
40
60
75
80
90
100

CAPTION FOR MENTAL VERSUS MEDICAL CHART

Evidence that increases in percentages of Caucasian genes in Negro populations improve mental performance and degrade physical performance is furnished by the preinduction test results reported by the Office of the Surgeon General, Department of the Army. The 1968 results show that Negroes in Georgia in the Third Recruiting District have a mental disqualification rate of 47.3% or an IQ of about 80 compared to 17.5% and 90 for California in the Sixth District. The superior performance of Negroes in California compared to Georgia supports the theory that Negro IQ is raised by an admixture of white ancestry. California Negroes have twice as high a percentage of their genes from white ancestors as do Georgia Negroes according to an estimate based on measurements by Professor T. E. Reed of the University of Toronto of 22% Caucasian genes for Oakland, California and 11% for Evans and Bullock counties, Georgia. Reasoning from the trend shown by all the recruiting districts for both Negro and non-Negro inductees, Professor William Shockley estimates that the average IQ of Negro populations increases by about one IQ point for each 1% of added Caucasian genes and might match or even exceed the whites at 30 or 40%. The physical qualifications correspondingly drop. Professor Shockley urges that his hypothesis should be tested by determining the percentages of Caucasian genes for representative populations of Negro inductees. Such research might also permit evaluating the claim that Negro-white differences in medical disqualifications are biased by the poor medical counseling available to the economically disadvantaged.

the areas. I would also like to add to this Natural and Sexual Selection. In the early South, we often found isolated pockets of Negroes who selected for or against each other for various reasons. William Shockley, a Physicist from Stanford University, and A. R. Jensen, a student of Education from Harvard, go so far as to suggest that intelligence increases and decreases as the percentage of Caucasian genes increase in the "M" of American Negroes. Happily Geneticist and other Scientist in general find no scientific basis for this belief. Environment could well cover any variation between the races.

As we have stated earlier, the American Negro (Afro-American) is a heterozygous individual with many variations due to over 200 years of inbreeding. In that time genes from the Monogolian and Indian as well as Japanese National groups have been added in larger numbers than most believe. We are truly a product of the great melting pot known as the United States of America and maybe other than the American Indian the closest to being the real American.

References and Notes

"Caucasian Genes in American Negroes". T. Edward Reed; Science 165:762-768, Aug. 22, 1969.

"Studies on the Inheritance of Human Skin Colour." G.A. Harrison and J.J.T. Owen, Annals of Human Genetics, London, 28: 27-37, 1964.

Paper on Genetics. Louis Levine, 1971. C.V. Mosby Company, St. Louis, Missouri.

"Non-Du-Tested Data for Africans, Negroes, and Caucasians." American Journal Human Genetics, 7: 368, 1955

Use of Du-tested data for Africans and Non Du-tested data for others give M-O.281.

"Race, Social Class and I.Q. Sandra Scarr-Salapatek," Science, Vol. 170, No. 4016, p 1285-1295, Dec. 1971.

"Estimation of the Limits of Heritability of Traits by Comparison of Monozygotic and Dyzgotic Twins". A. R. Jensen, Proceedings of the National Academy of Science, U.S. 58, 147, 1967.

"How Much Can We Boost I.Q. and Scholastic Achievement?" A.R. Jensen, Harvard Educational Review 39, 1-123, 1969.

"Behavior-Genetic Analysis and Its Biosocial Consequences". Jerry Hirsch, Ph.D. Seminars in Psychiatry, Vol. 2, No. 1, Feb. 1970

Presented at XIXth International Congress of Psychology, London, Englans, July 30, 1969.

LYNETTE PADMORE, a native of Guiana, is assistant professor of Biology at Florida A&M University and a geneticist on Florida's Inter-University Program in Medical Science. She holds a Doctor of Philosophy degree in Zoology from Howard University. Her research articles have been published in the American Zoologist. She is a member of several professional organizations, and is currently serving as the Secretary of the Southeastern Association of Advisors for the Health Profession.

GENETIC ENGINEERING AND ITS IMPLICATIONS FOR THE BLACK COMMUNITY

Lynette Padmore

Twenty years ago, the layman was not aroused by the mention of the term gene because he was not fully aware of its action and could not foresee the impact such a term would have on him and his offspring. Today, the layman is aroused by the terms genes and genetic engineering but, unfortunately he is still not fully aware of its implications.

Genetic engineering has not been analyzed to the point where its reference brings forth the same picture to every group. The biochemist may see it as an avenue for further manipulation of the chemistry of the genetic material. A sociologist would probably eventually produce an improved group of individuals. A medical doctor can visualize the day when most of his anxiety over a particular disease can be alleviated by substituting a 'good'gene for the 'bad' one carried by the patient. The layman has been innocently caught up in the swirl of presumed benefits to be derived from genetic engineering. The apostles of genetic engineering have focused on the end of the picture without paying much attention to the means.

Because of man's ignorance of the field of gentics, we have suffered from ridiculous degredation by others. The basic facts of the means by which traits are transmitted from one generation to another can be assembled in a manner such that the general public can become at the least, moderately acquainted with the reasons why there may exist a difference in appearance between individuals of the same family. Various cases of albinisms, as an example, can be placed in their correct perspective. Albino children and even adults are sometimes regarded as being 'strange' by individuals who are ignorant of the reasons why there is a difference in skin pigmentation. I refer to a special case of a child with whom I

grew up. The individual in question was an albino. This type of albinism was inherited as an autosomal recessive trait. The parents of this individual were both normally pigmented, and neither parent had any indication that he or she was a carrier for albinism. I can distinctly recall the various aspersions to which the individuals in question were subjected. Over the years, I have lost contact with the individual but I cannot forget the unwarranted unhappy moments she suffered. This child was a victim of nature and at the same time she was a pupil of ignorance. Her childhood could have been more pleasant if the populace had been acquainted with the genetics of albinism; her parents could have understood the risk of their producing an albino child if they had had adequate counseling.

One author has substituted the term genetic manipulation for genetic engineering. Both of these terms seem to indicate that the methods involved in finding a solution are mechanical. It seems to be the intent of advocates of this concept to improve the gene pool. Curiosity in this field has been aroused with publication centered around the isolation of certain bacterial genes and the synthesis of a gene. Further speculation has been fostered in conjunction with the knowledge that mammalian cells can incorporate foreign protein and nucleic acid. This realization has induced the belief that it will be possible to repair segments of DNA with normal DNA. Some speculators have even inferred that we may be able to replace all of our 'bad' genes with 'good' genes.

Discussion on this topic could be lengthy, involved and may eventually be fruitless. Whatever the consequences may be, the possibility of genetic engineering has stimulated concern and interest in the field of genetics. Geneticists should be gratified by this advancement.

In considering the implications that genetic engineering may have to the Black individual, one must consider the needs of Black people. Blacks need not be any more or any less interested in this topic than any

other ethnic group. There are approximately 1500 diseases which are known to result from some type of genetic disorder. Of these, only a few have been found to be typical of a particular group or individuals. This number is not significant enough for any one group to isolate study of itself. Individuals of all races should be aware of the genetic changes which are peculiar to or preponderate their group. This course, however, should in no way obstruct the idea that, for all individuals of a particular species, the mode of transmission of a particular trait is similar.

Genetic diseases are transmitted in different ways. Some are believed to be monogenic - that is they result from the action or inaction of one gene; others may be polygenic - resulting from the action of several genes. Monitoring or manipulating monogenic inheritance will essentially be more feasible than such accomplishments in polygenic inheritance. The genes involved in polygenic inheritance may be located on different chromosomes or may be several map units away from each other. The prospective "engineer" will be confronted with a problem of timing the actions of these genes, unless he can simultaneously correct all of the genes that are involved. The prospect of achieving this goal does not seem possible within the near future; this is not to say that such accomplishments are impossible. Another equally important factor to consider will be the multiple allelic series of some genes. Would it be possible to add an additional allele to such a series?

Consideration should also be given to the area of cytoplasmic inheritance or extrachromosomal inheritance. Until recently, the possibility of a genetic system distinct from the chromosomal genetic was not given much consideration. It is now known that there are organelles in the - cytoplasm which are self replicative; in fact they seem to have a genetic system distinct from the nuclear system. Spurts of 'low-keyed' investigative work have also indicated that other factors which are not necessarily organelles of a cell may be not only replicative but also transferable from one generation to another in insects. If this type of inheritance should become more evident it will be of

special importance to the female members of our population. For most sexually reproducing organisms, the male contributes very little cytoplasmic material when compared to that contributed by the female. This is the major reason why, when the factors are known to be located in the cytoplasm, the transmission is referred to as maternal inheritance.

At the present time no one can gurantee the success or failure of genetic intervention at the human level. It thus remains a risk for which we have no evidence for or against. If we were to take into account the whole individual such evidence may not be forthcoming for a full generation. To an idealist this type of intervention may seem to be the only recourse. However, one should investigate the alternatives to relief from genetic mistake. Chief among these are:

1. Heterozygote detection
2. Genetic education
3. Genetic counseling
4. Further investigation of correcting errors in utero-further exploration of aminocentesis.

Whether we select genetic engineering or one of the available alternatives to improve the genetic material it will be necessary to educate the public.

Genetic counseling is becoming more significant because of the recognition it is now receiving by informed individuals. It must, however, be clearly stated that not every geneticist is a counselor. A good counselor should exercise care and not interject his own viewpoints during counseling. In addition the counselor shoud work in close association with the patient's physician since an accurate diagnosis of the problem is a prerequisite to counseling. The genetic counselor can be of assistance not only to parents but also to individuals who are planning on starting a family. It is advisable that these prospective parents consult a counselor if there

is any indication of possible genetic defect. These individuals may even go a step further and arrange to have their thromosomes analyzed. Indeed, because of the rather inexpensive nature of such an analysis, this test should become a routine one for individuals who plan to contribute to the next generation. Balanced abnormal chromosomal conditions may be revealed by this simple test. In addition, certain biochemical tests can be made to determine whether or not an individual is a heterozygote for a particular genetic defect.

Genetic education and counseling seem at present to be the best and the least expensive alternatives to our problems. The same means by which the concept of genetic engineering is being propagated can be used to educate the public. Interest in the field has already been aroused. It is now the responsibility of all concerned individuals to sustan the interest generated. By genetic education, I mean publicizing the pattern of simple Mendelian inheritance. The public should be more aware that if they are heterozygous for a particular autosomal recessive trait that there is a possibility that their offspring will be affected if they should marry another heterozygote or someone who shows the trait.

Black people can, by becoming more aware of genetics and of specific hereditary diseases of blacks, make the scientific community address itself to health problems of blacks. In addition we can, at a very early stage, inform our children that the majority of genetic problems with which they may be affected are not peculair to blacks but may be found among our ethnic group. The black community can become informed by way of special community seminars. These seminars can be conducted at a level that will reach out to the general public.

It is the hope that the considerations mentioned above will not be deemed as being supportive either for or against proposals for genetic engineering. The thoughts expressed are intended merely to stimulate all individuals concerned to thoroughly investigate all of the facts available and to find some means

of passing this information on to the public. This will not necessitate that the public enroll in a course in genetics. The news media can be very valuable in stimulating the necessary awareness. In addition, as was mentioned above, community seminars will be very beneficial.

REFERENCES

B. D. Davis, "Prospects for Genetic Intervention in Man", Science, 1970, Vol. 170, No. 3964, pp. 1279-1283.

T Friedmann and R. Roblin, "Gene Therapy for Human Genetic Disease?", Science, 1972, Vol. 175, No. 4025, pp 949-954.

L. Levin, Biology of the Gene, C. V. Mosby Company, St. Louis, 1969.

John J. Mulvihill, 1972, "Congenital and Genetic Disease in Domestic Animals", Science, Vol. 176, No. 4031, pp 132-137.

CECILE EDWARDS, professor of Nutrition and Research and chairman Department of Home Economics at Howard University, is a well known researcher, specialist, and teacher of human nutrition. Dr. Edwards has carried out numerous investigations and has directed many research projects in nutrition funded by National Institutes of Health, Nutrition Foundation, and Central Food Technological Research Institute of India. Dr. Edwards obtained her Doctor of Philosophy Degree in Nutrition from Iowa State University of Science and Technology. Her numerous research publications in scientific and professional journals includes forty in a series on FOOD FACTS in Service Magazine. She is a member of many professional and social organizations.

NUTRITIONAL PROBLEMS OF BLACK AMERICANS: IMPLICATIONS FOR FUTURE STRATEGIES IN HEALTH, SOCIO-ECONOMIC AND EDUCATION PROGRAMS

Cecile H. Edwards

The topic today is one that I have a great deal of personal interest in, not only because I am a nutritionist, but also and primarily because I have a concern for people. Though my interest for many years has been in the area of research, I have always sought to apply research to the betterment of people. In 1951, at Tuskegee Institute, we began to explore the diets of Black Americans in an effort to learn more about their eating patterns. The information obtained then and in subsequent years of research on diets of Black Americans has important implications for what I think is a very serious problem. We will look first at the larger aspects of the problems of Black Americans.

If one looks at the percentage of Black Americans in relation to the total population of the United States it can be seen that in 1940 we were 9.8% of the total population; now we are 11.2%. We live mainly in urban areas now and this trend of the Negro population to move into urban areas is increasing. If we consider life spans in years, we live less long than white Americans. The life-expectancy of the black male is roughly 67 years and that of the white American male is about 71 years. Where do we stand education wise? Considering the number of children between 6 and 13 who are at their normal grade for age, more white Americans are in their expected grade level than black Americans.

In homes of Black Americans the mother is often the head of the family. For example 27% of our children have only one parent in the home, who is the mother, whereas in the white race only 7.5% have a one parent family. There is some question, however, as to the validity of the tests which are used to provide this information.

Many households in the United States have been classified in the poverty and below poverty zones in regard to income. The distribution of families at the poverty level is probably greatest in the South. In the northeast and in the west, in the north central states, and in the north, the percentage of families who are in poverty is greater for the Negro race than for the other races, but a higher percentage of black families in poverty are in the South. Generally speaking, we will find that the more affluent the family the smaller the percentage who are classified as below recommended levels in regard to nutrient intake. Our annual income is less as Black Americans. There is a higher percentage of tuberculosis among Black Americans than other racial groups in the United States. Tuberculosis is an index of poverty in a sense, but more so of sanitary conditions. black Americans have a higher percentage of maternal deaths than white Americans. And even though we have a higher fertility rate, more of our infants die at birth or about four days later. These kinds of information have implications for the larger problem I alluded to and for what can be done in the areas of health and education.

Let us look at nutrition within this framework. Most of us know that certain foods are good to us and that some foods are better than other foods. But we should also remember that diet is very important for many specific reasons. It is very important in terms of providing energy to do work. Individuals who have better diets are able to achieve more, have greater work capacity and accomplish more. Good diets are also important in maintaining resistance against infection. So most people who eat well catch fewer colds, they lose less time for work, they feel

better because they don't have the vague symptoms of ill health.

Malnutrition is defined as poor nutrition because of insufficient or poorly balanced diet or because of defective digestion or utilization of food. It is a complex of diseases depending upon the nutritional deficiency involved. So, to say that a person is malnourished can mean that a dietary deficiency of several nutrients exist or it can mean that the person has specific nutrient deficiency. In the United States today we very rarely see specific nutrient deficiencies, such as scurvy, beriberi or rickets. We more often see anemia, apathy, easy fatigue, listlessness, symptoms of what I call the twilight zone in nutrition, the borderline area. Since there are over 40 nutrients, one could have a deficiency of one of these or combination of them. We could determine that the person is malnourished by biochemical measurements. We would look at the individual's diet; we would take samples of his blood and excreta and we would analyze them and then we can say that a person is deficient in ascorbic acid (Vitamin C) or a person is deficient in thiamin.

We can define malnutrition. However, hunger is a more illusive thing. We now know that good nutrition is essential for normal brain development. In the human being the greatest spurt of brain growth occurs during the fetal period. By the time the child is in his first year of life the brain has assumed about 70% of its adult weight. By the time the child is in the second year the growth of the brain is almost complete. It has been shown that in the human brain the amount of DNA (deoxyribonucleic acid) can be used to measure brain cell growth. In the development of the brain there are stages and critical periods of development and maturation. It is very important that each nutrient that is required for each process, whether it be coordination or memory, skill, or motor development, be present at specific times. Unless the nutrients are there when needed, the present idea is that the total numbers of cells which would be involved are not formed.

DNA is present in every cell. It is localized in the nucleus and if one measures the amount of DNA one can calculate the number of cells. So that one can actually determine the number of cells in the brain. And this has been done. For example, in Chile, the brains of children who died accidentally and from malnutrition were examined. The DNA in these brains was measured and it was found that the children who died from malnutrition had fewer brain cells than those who died from accidents. This research has stimulated great interest among nutritionists and biochemists: Scientists began studying this in rats, pigs, and monkeys to find out if indeed this was true, and to see what correlations existed between the work in animals and in humans. In a study of one thousand Ugandian children, from birth to 15 years of age, the analysis of brain weights showed that in children who were malnourished, these weights were significantly lower than those of the control groups. In Santigo, Chile, three groups of children were studied; those who were malnourished from poor socioeconomic backgrounds, those who came from a similar background and who were not malnourished, and a comparable group who were eating good diets. It was shown that there were certain abnormalities in the malnourished group. The abnormalities that I am referring to were in the area of intelligence and these were evaluated by measurements of I.Q. Other investigations have shown a significant correlation between low intellectual ability and head circumference. The lower the distance around the head the stronger the possibility that the child will have a low I.Q. In animal experiments, it has been shown that when diets were low in animal protein during infancy that brain development is impaired.

There is also a correlation between the environment in which the child lives and his potential for development. The lower the mother's I.Q., the more likely it is that the child will be malnourished. And there are many socio-economic factors that come into play.

There are some individuals who feel that this relationship between diet and intelligence is simply one where, if the child does not have enough calories, he sits around because he doesn't have enough energy to explore. He is too hungry to become involved with his environment and, under these circumstances, he doesn't come in contact with the kind of information that a child who is aggressive would come in contact with.

What about nutrition and behavior? How do we act if we are malnourished in relation to the performance of a person who is well nourished? It has been shown that animals who are kept on deficient diets will have a lessened tendency to explore. Children who are hospitalized for malnutrition are apathetic: they are lethargic; they are irritable. When one is in a chronic state of hunger there are some indications that these behavioral changes may have long term effects. There are many factors that come into play. Parent-child relationships affect the child's intelligence. Parental expectations, the intellectual stimulation that is given the child, the incidence of infectious diseases that the child encounters, the level of intelligence of the parent, socio-cultural pattern, and other genetic and environmental factors----all affect mental development.

Nutrition is a major factor in childhood mortality, morbidity, and growth. There is a definite relationship between diet and income. Wherever poverty exists, malnutrition is most likely to exist. An evaluation of the possible relation of diet to mental development cannot exclude such factors as cultural level, intelligence of the parents, and the environment in which the child lives.

A number of incidents have led to a crescendo of interest in hunger and malnutrition. The reports of a group of committees in the Senate and the House, for example, hearings before the Select Committee on Nutrition and Human Needs, the White House Conference

on Food, Nutrition and Health, and several other reports created increased public awareness of hunger and malnutrition. The study of poverty in the Mississippi Delta Region, sponsored by the Field Foundation in June 1967, the publication "Hunger, USA" by the Citizen's Board of Inquiry, the CBS television documentary on "Hunger in America", are other examples. A result of these investigations was the authorization of a survey of the nutritional status and the incidence of malnutrition in the population in the United States. Ten states were selected for this study and the preliminary data on the National Nutritional Survey are now available to us.

This survey shows very clearly that there is a higher incidence of malnutrition in lower income groups and in less well educated groups such as Black Americans, Puerto Ricans and Indians. The majority of these families had incomes below $5,000 and many had incomes below $3,000.

What are the nutritional problems of Black Americans? Let us look at the data from the National Nutrition survey. Here we see the data for vitamin A compared by race, i.e. Negro, Oriental and American Indian. The thing that comes through rather clearly is that there is as little vitamin A deficiency in the white race as there is in the Negro race. What I am saying here is that vitamin A deficiency is not a special nutritional problem of Blacks. If you look at our diets and remember that we like collard greens, sweet potatoes, you can actually see that black Americans have a good intake of vitamin A. With respect to ascorbic acid, vitamin C, you will notice that about 5.7 percent of whites are deficient in vitamin C, whereas in black Americans 8.3 percent of the diets were deficient or low in vitamin C. The data show that there are about 7.8 percent of the diets of white Americans in the study are deficient or low in riboflavin; in the black race 21.9 percent of the diets were deficient or low in riboflavin. This figure is higher for the Black race than for any other race. This suggests that there may be a problem with riboflavin with regard to the Black race. When one looks at two or more criteria together, such as vitamin A, ascorbic acid,

and hemoglobin, more often the Negro race was biochemical values below the level expected, suggesting diets indicative of a nutritional deficiency.

From my own research, additional information on nutritional problems of Black Americans was obtained. In one of our very early studies on diets in the South, we were interested in getting some information about Black families. Our concern at the time was to learn more about diets, but as we got into the survey, as we began to interview people, as we sent questionnaires to public health departments, we began to learn that a very large percentage of our people eat clay and cornstarch. The point that I want to make here simply is that the regular diets of these people who ate clay and cornstarch were generally poor. The amount of dietary protein was low compared to recommended dietary allowances; the calcium intake was also low, the amount of iron was lower then the recommended allowance. Dietary intakes of vitamin A, riboflavin, and niacin were satisfactory. In the control group, who ate neither clay nor cornstarch, dietary intakes were near standard; the protein intake of this group was a little lower than it should be, and the calcium and iron intakes were low.

We were interested in going further into this matter so we brought into the hospital at Tuskegee Institute about 86 of the women who ate starch, and/or clay and a set of controls who ate neither substance. Our interest was not only in knowing what effect these unusual dietary substances had on the women but also what effect it had on their infants. We found that the hemoglobin levels of the women who ate clay and cornstarch were indicative of mild anemia. The serum protein levels were normal and there was no problem with calcium or blood sugar (glucose). A group of these women, the ones who delivered in the hospital, were the ones we studied in more detail. We collected samples of excreta and analyzed these to determine nitrogen, calcium, and iron balances. We observed that the women who ate clay seemed to have fewer calories in their diet when they did not eat than when they ate it. Similarly in diets of those

who até cornstarch, the caloric intake was much less when they didn't eat starch than when they ate it.

Another effort that we made a long time ago was a demonstration program to parents of children of the benefits derived from improving diet. The experiment was conducted in a rural school very close to Tuskegee Institute; there were about 1,000 children enrolled. We used as a supplement to the diet Multi-purpose food, a product made of soy grits. There were two graduate students who prepared a hot soup for the children who normally came to school and ate nothing during the lunch hour because they had no money (or if they had a nickle they went to the candy machine and got a chocolate bar). Another group normally ate the school lunch; we took half of that group and improved their school lunch by adding the supplement to it. Group one was a control group who received no attention from us. Group two received the hot soup every day. Group three ate the school lunch; and group four got the improved school lunch. We wanted to see if we could improve response to classroom subject matter. Grades of these children were checked before and at the end of each semester for two semesters. We found that grades of the children who served as controls (had no nutritional information, dietary supplement or stimulation) improved by .13 units during the semester. The group that got the MPF soup showed an improvement of 21 units. In the second semester the change for some reason was not as great but with a slightly better edge for the students receiving the soup. In the group of students getting the school lunch there was a slight change; those receiving the improved school lunch showed greater improvement of scholarship.

If I were to summarize data with regard to Black Americans from my own research and the findings from the National Nutritional Survey, I would say that the four main nutritional problems of Black Americans are: 1. iron deficiency anemia which is reflected in lower than normal hemoglobin levels. This is rampant in black Americans. 2. Pica, which is the practice or

habit of clay and cornstarch eating. It is a nutritional problem because it affects the intake of Black Americans. 3. Obesity. Obesity can be classified as a nutritional problem because nutrition is concerned with both poor and excessive levels of intake. Excessive nutrition is just as much a nutritional problem as undernutrition. A person who is obese is just as malnourished in a sense as a person who shows the symptoms of nutritional deficiency. I don't think anyone can contradict the concept that too many of our black Americans are too much overweight. I would identify obesity as a nutritional problem of black Americans that needs attention. 4. Malnutrition. This category is where one sees the symptoms of various nutrient deficiences.

I can best describe this fourth nutritional problem by discussing the four categories of nutrition. One is optimum nutrition where one experiences vigor and bouyancy, and vibrant health. The second category of nutrition is adequate nutrition, and this is where many of us fall. It is where we eat the right thing at the right time, and we can get our work done and just have a normal amount of fatigue. We don't have that extra pep or lift that we get from optimum nutrition. A third category is borderline nutrition. Borderline nutrition is the plane of health in which we have less than recommended amounts of calories, proteins, minerals and vitamins. In the area of borderline nutrition we do not show the frank symptoms of nutritional deficiency. Instead one sees the child who doesn't have the enegy to play on the playground. This is the person who is irritable and doesn't know why. This is the person who doesn't get along with others and is out of sorts most of the time.

Many black Americans suffer from borderline symptoms but don't actually show the bleeding gums (gingivitis) of vitamin C deficiency; they are listless, they tire easy, they do not explore.

We took a look at the diets of Black Americans. I think you will recognize some of these foods. We studied how we could put them together in combinations which would do more for health. You have two alternatives when you try to work in the area of applied nutrition. One is to give the person money (and recommendations for food purchases) or food supplements, meat, milk, and eggs. You are giving them resources, food resources. The other alternative is to take what they have and what they like and try to arrange it into a combination which is more beneficial nutritionally to the person. In our research we took collard greens, sweet potatoes, cornbread and fatback, nitrogen retention was improved.

I want now to suggest action programs, strategies, ways in which we need to move. I have tried to say several things this morning and the message that I have tried to get across is that nutrition and diet affect performance, work capacity, growth and development, and physical stamina. I have pointed out that there are more Black Americans who are malnourished. I have said that I think the four major nutritional problems of Black Americans are: obesity, pica, iron deficiency anemia and borderline nutrition. It is timely to suggest ways to solve these nutritional problems.

Future strategies: what can you do, what can we do? There are certain age groups in which nutritional problems more frequently occur. When I talked about nutrition and mental development and I stated that the problem exists during gestation and up until the child is six months of age. The pregnant woman as one individual we need to concentrate efforts on. The infant up until six years of age is another. And so one possibility as to where we can do something is in Headstart and similar programs. In Headstart, many of the preschool children are enrolled. If some attempts can be made to work with the pregnant woman, to work with the woman after she has delivered and her young infant, to work with children in the preschool years, then there are possibilities of getting at problems related to poor nutrition. We can identify Headstart as an

area which would offer opportunities for Black youth at an early age to receive something a little bit different, perhaps a little bit improved, perhaps an educational advantage, something better than that to which they may be exposed in the environment. Of the children who are enrolled in Headstart, there are more Negro children in the program for the full year and the summer. The point is that Headstart programs are here and they are set up to serve all ethnic and racial groups; we need to think then in terms of increasing the participation of eligible children. There would be another alternative, that is of getting more of our children into child nutrition programs. We have a large percentage of school children participating in child nutrition programs in the southeast and southwest. Our effort would be to increase the Black enrollment.

I have suggested to you in a general way that we need to give more attention to our children. I stated that in many Black American families there is only one parent and that is the mother. There are more mothers working among Black Americans so that the child is left perhaps with a grandmother or a neighbor to take care of the child until he reaches school age. The environment in which the child lives is important; diet is related to intelligence; good diet is essential for a child to perform well in school. These facts suggest courses of action that we can follow. One, we can engage in political action, political action by Negro voters. Political action, includes writing to our congressman to get him to support family assistance and comprehensive child care. Why talk about family assistance? One group of people say don't talk to us about food, give us food or give us money so we can buy food. So one alternative would be a family assistance program so there will be a guaranteed income for all Americans. Comprehensive child care is essential because this provides an opportunity for the millions of Black mothers and mothers of all races who must work to have their children enrolled in programs which would have certain standards for child care. These are national types of legislation. The Comprehensive Child Bill was vetoed by President Nixon in November. Number two: we need to set up

campaigns. Black organizations and agencies need to take the leadership in accelerating the enrollment of Black children in Headstart programs. We need to enroll our pregnant Black women in the low income group in supplemental food programs. There is such a program at the Guilford County Health Department. In these programs women are given food supplements during pregnancy and this increases the chances that they will give birth to children who have a better opportunity for reaching their potential.

There is an old idea or an old wives tale that the child will get what he needs in spite of what the mother eats. That is not true. If a mother does not eat properly during pregnancy the child will suffer. The child will suffer by being smaller, the child will suffer by risking the possibility that the number of brain cells will not be adequate to enable the child to reach his full potential. Remember that specific nutrients must be present at certain critical periods of growth and development and if not there, there is the possibility that the child's intellectual development will be altered. It is not true that the child will get what he needs in spite of what the mother eats.

We need to have community campaigns to encourage parents to enroll their children in free school lunch programs. Since we now have free school lunch programs available we need to get more of our Black children enrolled in them, those that are eligible to participate. We are aware of the psychological reasons against this. Children don't like to stand in a line so that their friends know they are getting free lunch; but this is a way that they can improve their nutritional intake.

There should be community pressures on our legislators to make nutrition education a requirement for certified programs at the kindergarten and elementary level. "If you give a man a fish, you will feed him for a day. If you teach a man how to fish you will feed him for a life time". We need to teach our children why nutrition is important so they will know and understand. We need to have community pressures to

get legislators to appropriate funds for school lunch opportunities for children. Our legislators should do what they can to get nutrition education into the curriculum.

We cannot say nutrition is the only thing we need to work on. The home environment, the education of the parents, the situation within the community, all of these things affect what happens to the child. And so we have to help the parents with home and money management, consumer education; we must do a job from many different areas. Thus, we need a program of Parent Education.

In summary, Black Americans have a very serious nutritional problem and this problem shows itself in four ways; 1. iron deficiency anemia, 2. pica, 3. obesity, and 4. borderline nutrition. Periods of nutritional crisis are during pregnancy, in infancy, and during preschool and school age. And there is something we can do about it. We can engage in political action as a group of voters. We can create pressure as parents, as citizens. We can start community campaigns. We can enlist voluntary efforts of professionals to work on an individual basis or with community groups. Through these avenues we can work toward improving the food resources available to our Black children and youth and our Black families.

To accomplish this there must be a master community plan. I would suggest that the leaders of several organizations like Jack and Jill of America, LINK's, INC., and leaders of church groups meet together to set up a steering committee which would draw up a master plan. They could then suggest to the many Black organizations in the community what projects these groups might support. In addition to the master plan, there needs to be a team approach. We all are working together in this. What good can come of this? We look forward to a new generation of Black Americans who are better able to meet the challenges of the present society. We must face up to reality. We cannot continue to turn our heads when they say our children are not scoring up to standard on national tests. And have

suggested to you that the problem may begin right down there in the early years with diet. The new generation is the one that we now must work on.

Greensboro has world acclaim for having been the site of the first sit-ins for civil rights.

You can make Greensboro the site of the first team-in for the benefit of the Black race.

BIBLIOGRAPHY

C.A. Hoover, and M. C. Coggs. 1948 Food Intakes of 50 College women studied. Journal of Home Economics 40: 193.

Cecile H. Edwards, J.A. Lomax and G. Grimmett. 1956 Effect of a dietary supplement on height and weight of children.

Cecile H. Edwards, G. Grimmett and J.A. Lomax 1956 Influence of a low cost dietary supplement on scholastic achievement and "personality factors" of elementary school children. Journal National Medical Association, 48: 244.

Cecile H. Edwards, S.McDonald, J.R. Mitchell, L. Jones, L. Mason, A. M. Kemp, D. Laing, and L. Trigg. 1959. Clay and cornstarch-eating women. Journal American Dietetic Association, 35:810.

Cecile H. Edwards, S. McDonald, J.R. Mitchell, L. Jones, L. Mason, and L. Trigg. 1964 Effect of Clay and cornstarch intake on women and their infants. Journal American Dietetic Association, 44:109.

C.H. Edwards, L.P. Carter, C.E. Outland. 1955. Cystine tyrosine and essential amino acid content of selected foods. Journal Agricultural and Food Chemistry, 3:952.

Cecile H. Edwards, M.R. Ruffin, I.M. Woolcock, and A.W. Rice. 1964. Efficiency of vegetarian diets as a source of protein for growth and maintenance. Journal Home Economics 56: 164.

C. H. Edwards, H. McSwain and S. Haire. 1954. Odd dietary practices of women. Journal American Dietetic Association, 30: 976.

A. N. Whiting. 1947. Current trends and events of national importance in Negro education. Section E: clay, starch and soot eating among southern rural Negroes in North Carolina. Journal Negro Education 16: 610.

J.H. Ferguson and A. G. Keaton. 1950. Studies of diets of pregnant women in Mississippi: ingestion of clay and laundry starch. New Orleans Medical and Scientific Journal, 102:460.

E. Payton, E.P. Crump and C. P. Horton. 1960. Growth and development. 7. Dietary habits of 571 pregnant southern Negro women. Journal American Dietetic Association, 37:129.

M. F. Gutelius. 1969. The problem of iron deficiency anemia in pre-school Negro children. American Journal Public Health 59: 290.

WILLIAM WEST, professor of Pharmacology and Radiology at Howard University School of Medicine, is a well known researcher in cancer cells, toxins, and tissue localizations. Dr. West has directed a series of researches funded by the National Cancer Institute and Pfiffer Foundation. He has to his credit numerous research publications and reports as well as a distinguished teaching experience in Pharmacology and Radiation Research. He holds the Doctor of Philosophy Degree from the University of Iowa and is a member of many scientific and professional associations including International Society of Biochemical Pharmacology and Society for Experimental Biology and Medicine.

DISEASES PREVALENT IN SOCIO-ECONOMICALLY DEPRIVED BLACK COMMUNITIES: ETIOLOGY AND INTERVENTION

William L. West

Introduction: Opportunities in the Health Care Field

Black universities have been committed by the nature of their origins, and by tradition to the training of people whose opportunities for education have been restricted by consideration other than those of inherent ability. It is a historical fact that federal subsidies and grants were diverted from universities where admissions were restricted to predominantly black students because of a national institutionalized type of racial prejudice. A stigma was attached to such schools, namely inferior. Black universities have been required to defend themselves against the application of this stigma of inferior which in turn impaired their usefulness by diminishing their revenues. From a historical view point, it is reasonable to assume that there are two important factors in the success of these institutions: scholarship and citizenship. Today, the scholar scientist must be politically aware and responsible. The citizen-scientist must know the system, understand the system and make the system work in his behalf.

Let us look for a moment at scholarship. Historically, black scholars were admitted to our top educational institutions on probation. It was the performance of these black scholars who opened the doors of a limited number of these institutions prior to the supreme court decision on school desegregation. These scholars removed the stigma of inferiority in the eyes of the majority of educators but today there is a new breed with whom you have to deal: the health administrators or the "science administrators". If we assume

that those handling federal funds are no longer hostile to us, then we should be given a disproportionate favorable share in financing in order to upgrade and undergrid our schools. Instead, "science or health administrators" (educated in most white universities) are still applying the stigma of inferior, and the system continues to give us a smaller piece of the pie.

Let us look for a moment at the size of the pie. The health industry sales have exceeded 70 billion dollars per year. The federal dollar contribution to this market is considerable. Both the health industry sales and the federal budget for health care and research are growing at a rate of over 15% per year. The budget for our National Institutes of Health, one of the major health care agencies, is rapidly approaching 2.0 billion dollars per year. Can you visualize the size of the pie? Ten percent of two billion is earmarked for black hospitals, schools and communities or ten percent of the jobs in the health industry. Need I say, that anytime 2.0 billion federal dollars are involved, politics are involved? Thus politics play a decisive role in the distribution of these funds. This type of spending is likely to continue and there is no depression in sight. Opportunities in the health professions and health industry are increasing rapidly. Health care delivery is one of the major crises we face today in this country and especially in socio-economic deprived communities.

Currently, there is room for everyone on the health care team. A truly multidisciplinary approach is a necessity. This approach can begin in your Black studies program which is attracting scholars from all the disciplines.

Will you continually accept the label of inferior on your education? If so, the primary disease in the black community is a psychological one.

Will you continue to accept a small piece of the pie? From what college campuses spring the new humanism which is vital for this country's survival? Can it be measured with antequated IQ tests which ignore

ethnic background and environmental factors? Is there a good IQ test? These are important questions that you can begin work on now.

The challenge is scholarship and citizenship now. Design your own IQ tests and write proposals to study the attitudes of the majority. Are they responsible for the failure of the system? Or you?

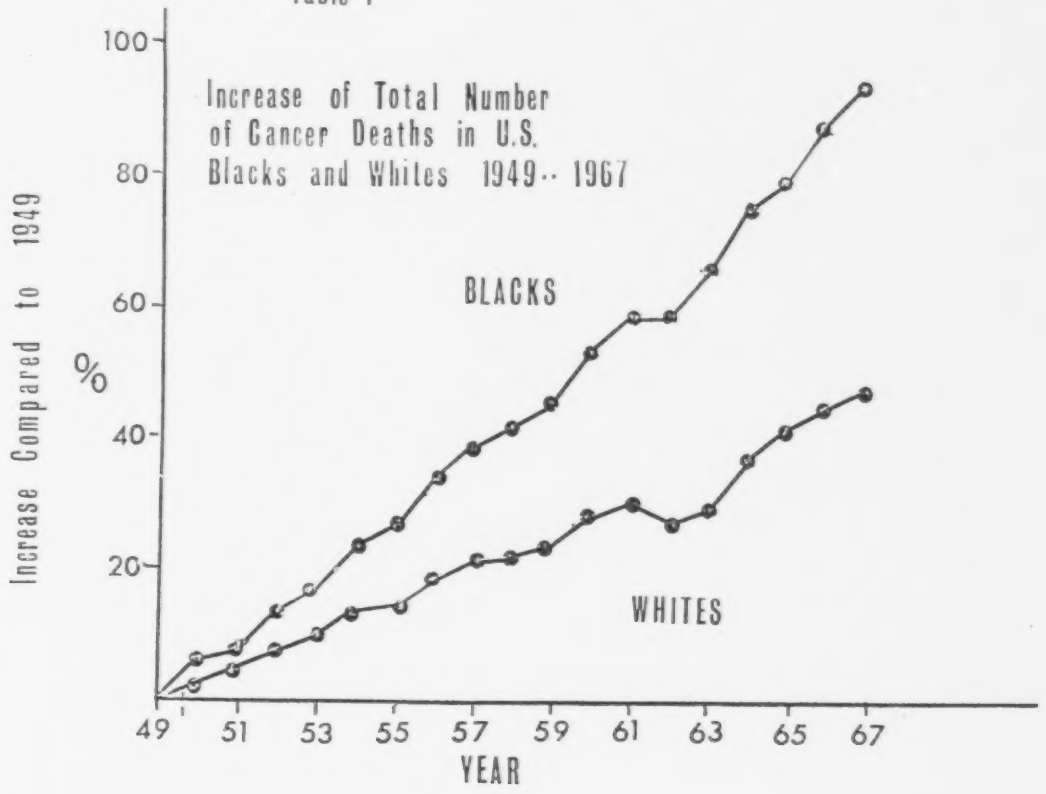
Many, but not all diseases in the socio-economically deprived communities are related to the failure of the system. We need young black dedicated health professionals who understand the system, and thrive on true scholarship. You must insist that the practitioner program concept related to current societal problems be a part of your curriculum, but not at the expense of existing scholarship programs. Health care delivery needs black scholars and practitioners from many disciplines with their new humanism. We all need our share of the political federal dollar pie in order to carry out meaningful programs. Scholars and dollars, the university and the community, the political scientist and social worker, basic scientist and physician, must work together to achieve a reasonable end.

The Alarming Increase of Cancer Deaths Among Blacks in the United States

(Prepared by Tumor Clinic and Radiation Therapy Unit, Howard University, Freedman's Hospital)

From 1949 until 1967, the number of deaths from all cancers increased twice as rapidly in the Black as in the White U.S. population (5.0% vs. 2.5% per year) Table 1. The increase was much higher for black males (7.1% vs. 3.1% per year) than for black females (3.21% vs. 1.9%) Tables 2 and 3. About 7,000 fewer cancer deaths would have occurred in 1967 in U.S. Blacks if the increase in cancer deaths since 1949 had been the same as in U.S. Whites. Of the 24 most frequent U.S.

Table 1


Increase of Total Number
of Cancer Deaths in U.S.
Blacks and Whites 1949-- 1967
BLACKS
WHITES
Increase Compared to 1949
%
100
80
60
40
20
49
51
53
55
57
59
61
63
65
67
YEAR

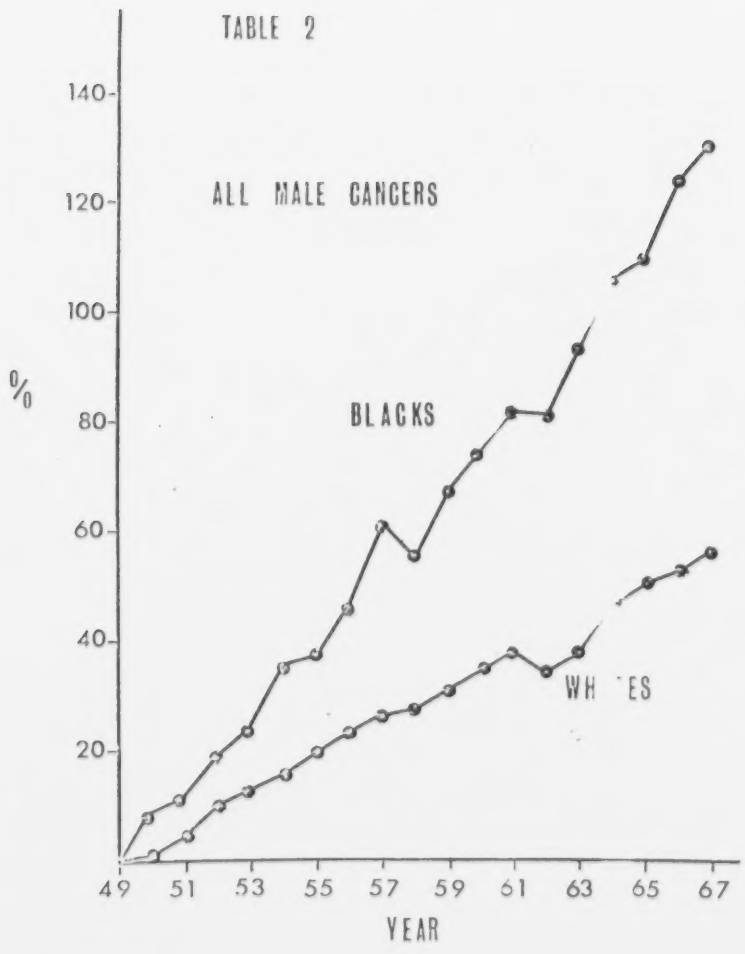
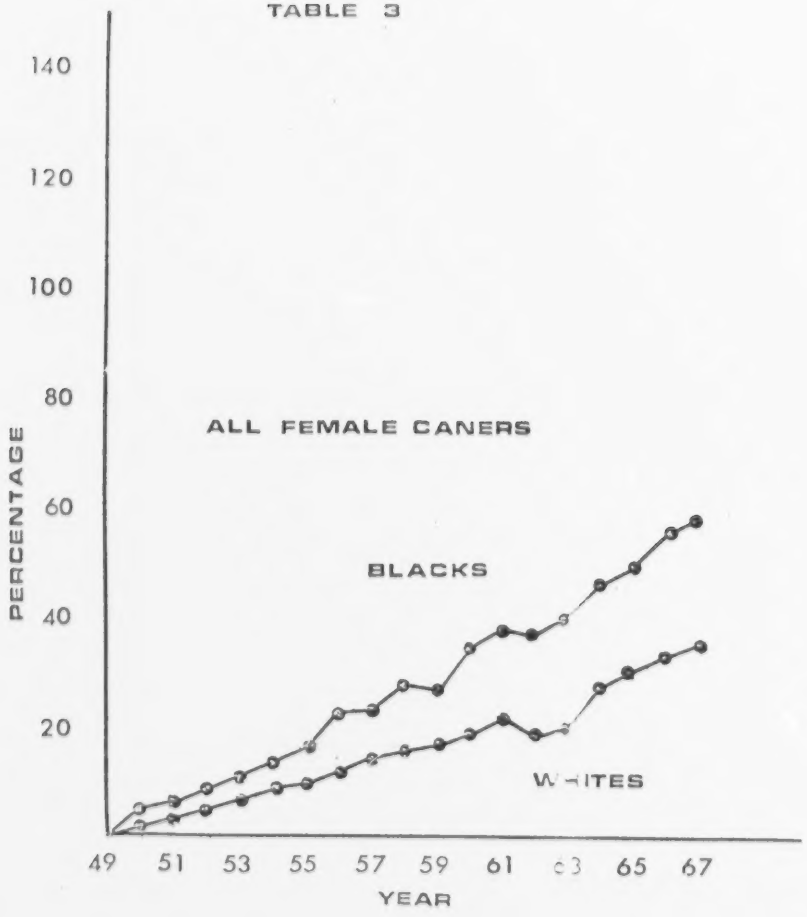


TABLE 2
ALL MALE CANCERS
BLACKS
WHITES
%
140
120
100
80
60
40
20
49
51
53
55
57
59
61
63
65
67
YEAR

TABLE 3


140
120
100
80
60
40
20
PERCENTAGE
ALL FEMALE CANERS
BLACKS
WHITES
49
51
53
55
57
59
61
63
65
67
YEAR

cancers, 18 recorded a more rapid increase of the cancer deaths in Blacks than in Whites from 1949 to 1967. Three cancers, namely stomach cancer, cervix cancer and rectum cancer remained essentially unchanged in Blacks, while they decreased significantly in Whites. Only three cancers, namely lymphosarcoma combined with reticulum cell sarcoma, Hodgkin's disease and connective tissue cancer showed no statistically significant differences between Blacks and Whites. (See Tables 1, 2 and 3).

The age-adjusted mortality rates for all cancer in both sexes in 1949 were 8% lower in Blacks than in Whites. By 1967, the situation was reversed, and Blacks had an 18% higher cancer mortality rate than Whites. This trend of higher cancer mortality rate had been 13% lower in 1949, but 22% higher in 1967 than that of white males. U.S. Blacks now have the highest known mortality rates in the world for pancreas and prostrate cancer. Perhaps these statistics reflect only better health care for the White population. However, this is doubtful. Perhaps care may be one factor among many.

3, 4-Benzpyrene and Placental Metabolism

(From the Master Thesis of Yvonne E. Harrison)

Yamaguis and Ichikawa demonstrated experimentally that coal tar possessed cancer producing activity in laboratory animals. A pure carcinogenic hydrocarbon was isolated and identified as 3, 4-benzopyrene from coal tar pitch in 1933. Since that time it has become evident that man is constantly exposed to low levels of 3, 4-benzyprene (BP) in his environment. This polycyclic, aromatic hydrocarbon is found in certain smoked and canned foods, polluted city air, the soil, tobacco smoke and in tars, mineral oil pitches and soots.

BP is a potent stimulator of drug metabolizing enzymes. The administration of BP induces several fold increases in BP hydroxylase activity in the liver, lung, gastrointestinal tract and skin. The peritoneal injection of microgram quantities of BP increased the activity of enzyme systems in rat liver microsomes and catalyzed the hydroxylation of BP. The stimulatory effect of foreign compounds on drug metabolizing enzymes is usually more marked in the immature male rat and in the adult female than in the adult male rat.

It has been demonstrated by Welch et al., that compounds present in cigarette smoke can induce an enzyme in human tissue capable of metabolizing the carcinogen BP. Welch et al. later showed that rat placenta can metabolize BP. It was also observed that orally administered BP can serve as a potent inducer of BP-hydroxylase in the rat placenta. Lijinsky and Shubik extracted BP and many other polynuclear hydrocarbons from charcoal broiled steaks. From the above, the question arose to whether hydrocarbons found on the charcoal broiled hamburger-steak, would have an effect on the formation of BP-hydroxylase. This was investigated in liver and placenta of rats. The hydrocarbon deposited on meats cooked over an open charcoal flame were sufficient to stimulate drug metabolizing enzymes in liver and placenta (1) (See Table 4 and 5).

Toxemia of Pregnancy

(Prepared in Conjunction with Ernest Hopkins, MD., Professor in the Department of Obstetrics and Gynecology)

Infant mortality rate was 24.8 per 1000 live births for the United States in 1964. The national fetal component was 16.4 and the neonatal component 17.0 per 1000. In the district of Columbia whose population is 798 thousand, 506 thousand are nonwhite (predominantly black), the economic affluent comprise 50% of the population. The remaining 50% (largely non-white) had an annual income less than $5,000. The latter group

TABLE 4

CHARCOAL BROILED HAMBURGERS

No. of Exp.	No. of Animals	a	Placenta ng/gm/hr 8-OH BP	S.E.	P[b]
I	3	C	2.5	± 1.0	0.05
	3	T	15.0	± 3.8	
II	3	C	7.5	± 0.0	0.05
	3	T	22.0	± 4.4	
III	3	C	3.45	± 0.6	0.05
	3	T	9.15	± 2.1	
IV	3	C	4.65	± 0.4	0.01
	3	T	26.25	± 0.5	

[a] C = hamburgers were cooked over charcoal and protected from flame with aluminum foil.

T = hamburgers were cooked over charcoal unprotected from flame.

[b] t = test for ungrouped data.

TABLE 5

CHARCOAL BROILED HAMBURGERS

No. of Exp.	No. of Animals	a	Liver ng/gm/hr 8-OH BP	S. E.	p[b]
I	6	C	470.0	± 85.3	0.01
	6	T	767.5	± 86.1	
II	6	C	352.4	± 58.0	0.05
	6	T	977.5	± 272.3	
III	6	C	103.8	± 13.1	0.05
	6	T	163.0	± 20.3	
IV	5	C	180.3	± 11.2	0.01
	5	T	286.8	± 22.2	
V	3	C	463.0	± 66.1	0.1
	3	T	1160.0	±100.4	

[a] C = hamburgers were cooked over charcoal and protected from flame with aluminum foil.

T = hamburgers were cooked over charcoal unprotected from flame.

[b] t-test for ungrouped data

is made up of people whose health care is a tremendous economic burden. The fetal component in D. C. was 17.8 and the neonatal component 25.7 per 1000 These neonatal rates reflect the magnitude of the importance of intrauterine factors which account for 90% of perinatal mortality. Similar inequities are apparent in national neonatal mortality figures. In addition the maternal mortality rate for Whites is 28.3 per 100 thousand and non-white 94.2 per 100 thousand (11-18).

Freedmen's Hospital, the teaching hospital of Howard University, services predominantly non-white medically indigent residents. In a 1969-70 study of 100 consecutive obstetrical cases, forty-six (46) of these patients experienced hypertension and/or toxemia of pregnancy. Thus nearly 50% of all complications were attributable to a toxemia of pregnancy like syndrome (characterized by convulsions, hypertension, and nauseau and vomiting). The etiology of the disease is unknown. A large percentage of these patients seek inpatient care with late or no previous prenatal care. Many of the children have a low infant birth weight. This finding may be indicative of inadequate feeding in utero.

Pregnancy is normally a hypotensive phenomenon. Why then is the sudden onset of this hypertensive episode where the generalized vasoconstriction endangers the fetus in utero (reduces blood flow and oxygen to the fetus).

Why does the disease seem associated with the socio-economically deprived? What are the environmental, genetic, nutritional and psychological factors involved? What are the sociological factors involved? These are some of the questions which you must answer.

Heart Disease in the Black Community

(Quotes with permission from a speech written by J. D. Johnson, M.D., Professor, Department of Medicine, Director, Cardiovascular Section and President of the Washington Heart Association; given at a Meeting of Concerned Citizens, December 8, 1971.

"Rheumatic Heart Disease is still a major problem in America even though we have known how to prevent and how to control it for twenty years (2).

It is a political and socioeconomic issue ---too big for Doctors to handle. It thrives on overcrowding, large families, poor nutrition, inadequate health maintenance and low priority rating for the average family in a highly competitive society.

The main health problem, however, which the Black community faces is hypertension and its ravages on the heart, the brain and the kidneys (2), (3).

Black citizens have twice as many stokes as non-blacks (2). They occur at an earlier age, and they often tear up the brain with hemorrhage, most likely due to the presence of hypertension. The medical problem in Black America is hypertension. It tends to express itself even in our teenagers. The prognosis is expecially bad, ages 15-30 years.

In that period of life, most vital for the development of home and the family, hypertension along with its complications, is a grim reaper for the Black American. Look at these astonishing figures. Between the ages 25 to 44 years, Hypertension kills Black Males 15.5 times as frequently as for White Males (4). For Black Females 17 times." (See Table 6)

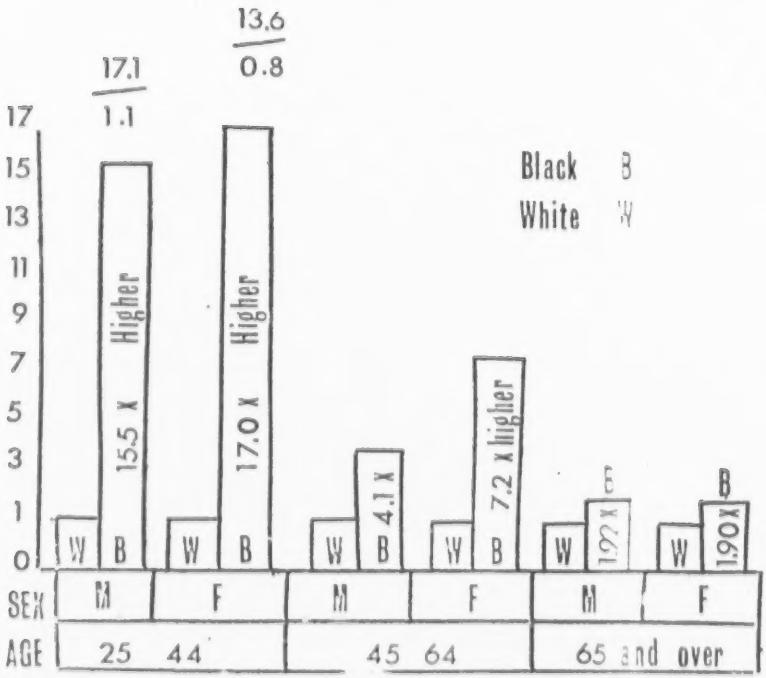
One of the great unfortunate things about hypertension is the fact that it is usually without symptoms until one of the complications has occurred. (6).

"This asymptomatic nature of hypertension is a serious problem. Let me illustrate by this slide which reports a large community survey in the city of Chicago.

TABLE 6

FILE ON HYPERTENSION

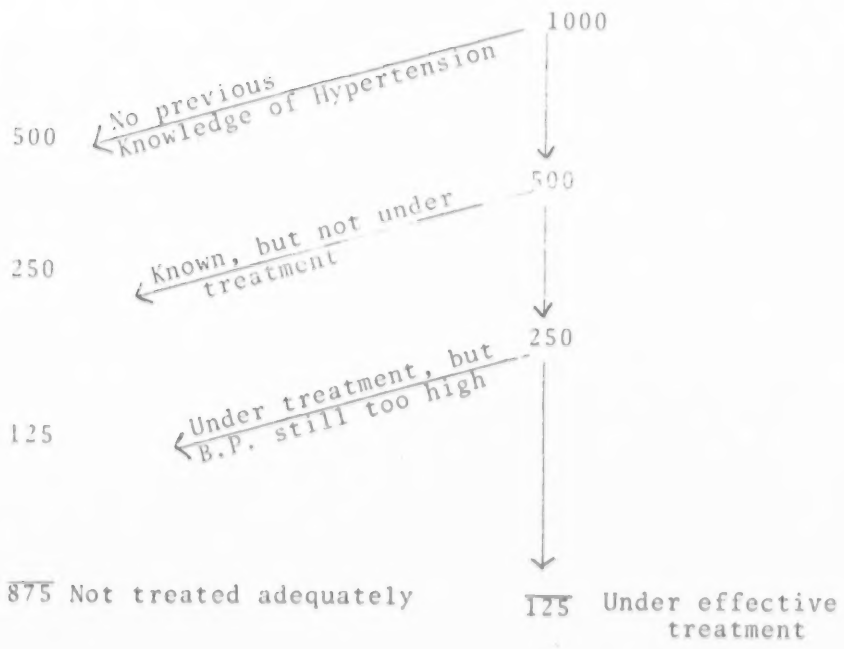
Hypertensive Disease Mortality Rates by Age, Sex, and Race
U.S.A 1968 — National Center for Health Statists, U.S.P.H. Service
Per 100,000 Population



A voluntary screening project was initiated. With a modest encouragement from out-reach peer, non-professionals, the community participation was about 75%.

1000 hypertensive individuals were found. Look at the analysis of the data (2).

TABLE 7



As each of you probably know there are certain risk factors which increase the chances of heart disease (7). The most important of these are:

Hypertension
Elevated blood cholesterol
Cigarette smoking
Abnormal electrocardiogram
Obesity

We dominate the American population in the prevalence of Hypertension, both male and female.

A recent survey in the city of Chicago showed that Black men smoke cigarettes 40% more frequently than White men. Black women, 17% more than White women (2).

It is now well demonstrated that the Black female dominates the field in obesity among American citizens.

Except for smoking cigarettes and obesity, these risk factors are not obvious. They must be screened for. A community effort is needed. An expected result might be that the risk of a developing major complication in hypertension is reduced from 55% to 18% by the use of antihypertensive drugs alone.

Nutrition and Diseases

Recently the television news media did a telecast on nutrition and socio-economic deprivation. In certain communities the conditions were deplorable. Spotlighted in the telecast were communities of Blacks in Mississippi and Mexican-Americans (Chicanos) in Texas where nutritional diseases were visible to all. Very few in depth studies have been done with the correct expertise. There are only a handful of Black nutritionists. Bradfield and Coltrin, 1970, studied Blacks in California and found that they represent 7% of the population. Most of the Blacks, 94%, live in urban

areas. The same trend is true nationally. Blacks rapidly left the decadent farms seeking a better life in urban areas. This resulted in the breaking down of most family structures, and exposure to pollution, drugs, and malnutrition. California may be used as a prototype for the nation. This study revealed 65% of the Blacks had not finished high school whereas in the total population 50% had not. Most Black men were employed as laborers and most Black women as domestics. Unemployment among Blacks were 13% whereas among Whites it was 6%. The annual income of Blacks is below the national average and most may be classed as poor. Health care is a tremendous economic burden.

This study revealed the following:

1. The birthrate among Blacks was higher
2. Black mothers experienced more complication during pregnancy
3. The premature births in Blacks were higher
4. The maternal death rate among Blacks was higher

The nutritional evaluation showed the following:

1. Blacks had a low ascorbic acid (Vit. C) intake.
2. Blacks had a low protein, calcium, riboflavin (Vit. B) and iron intake.
3. Blacks were more obese. Hyperlipoproteinemia and obesity are national problems.
4. Some Blacks, 4.8%, had abnormal hemoglobin levels and hematocrits.

In other studies in the District of Columbia, North Carolina, Maryland and Alabama, pre-school children showed:

1. Blacks had nutritionally poorer diets

2. Poor dietary intakes were related to family food habits

3. Blacks and other socio-economically deprived groups had a low caloric intake

4. Black children had the lower hemoglobin levels.

The factors associated are inadequate income, inadequate knowledge of nutritonal value of food and failure of health care delivery system. These by no means represent all of the factors.

Nutrition and Intelligence

Price, at Ohio State, showed that he was able to improve the IQ of a group of students by 20 points just by improving their diet. This variable alone could account for IQ difference between Whites and Blacks. In addition, nutrition begins in uterus the mother's food habits affect the child's well being. This parameter is more difficult to control. Not only the food habits but certain environmental pollutants (external) or conditions (internal) affecting the mothers health affect the unborn and eventually the born child. For example,

1. The inadequate oxygen to the fetus, which may occur during toxemia of pregnancy.

2. Possible anemia induced by certain drugs and again inadequate oxygen supply to the fetus.

3. Morphine addicted mothers give birth to infants addicted to morphine.

4. Carcinogenic hydrocarbons in cigarette smoke and polluted city air cross the placenta as does morphine and are found in the fetuses of experimental animals.

From the above, almost all may be prevalent in some Black communities. How many variables are related just to dissemination of information about health care?

Lead poisoning, though, not directly related to nutrition is prevalent in the Black community. It has a profound effect on the infant retarding growth and development. In old houses where paint peels off walls, paints containing lead are the major source of this lead.

NUTRITION AND GENETIC FACTORS IN DISEASES

Many adult Black people within one to four hours after consuming one or two glassfuls of milk, experience abdominal gas and cramps. Diarrhea may occur and some of these people may use milk as a cathartic. Such individuals drank milk when they were infants and children. As adults they can tolerate small amounts of milk as in cereal or with coffee. They cannot tolerate large amounts of milk as used sometimes in the treatment of peptic ulcer (two glasses or more).

Cow's milk contain about 50 grams of lactose per quart and human 70 grams. The signs and symptoms of intolerance to milk has been shown to be caused by an acquired deficiency of a carbohydrate splitting enzyme lactase, which hydrolyses lactose to galactose plus glucose. We are all born with enough of this enzyme. This acquired deficiency in children and adults is probably genetically determined. This type of lactose intolerance has been found in Greek Cypriots, Askenazic Jews, American Blacks, African Bantu, Japanese, Formosans and Filipinos.

Although not related to nutrition directly, the above mentioned cultural groups have high incidences of individuals whose red blood cells are low in an enzyme, glucose six phosphate dehydrogenase. A deficiency of this enzyme, does not lead to a disease per se. However, in these individuals certain drugs produce a-

hemolytic anemia. Drugs such as sulfonamide (antimicrobial) or quinacrine an (antimalarial) are well known examples. Here again there appears to be a genetic distribution to this enzyme. Also environmental factors may affect gene expression. These factors must be taken into consideration when prescribing drugs. In other words the cost to the patient is not the only conisderation. Similarly genetic differences must be taken into conisderation when the intervention of the disease process is through dietary means. Most animal species drink milk during infancy only. It has been noted that high lactase levels persist in the Black population who have consumed large amounts of milk throughout their history, for example, Batutsi in Uganda. One wonders if continuous intake of lactose induces alteration of gene expression.

To summarize, many of the gastro-intestinal disturbances (diseases) seen in children and adults may be related to gene expression of the enzyme, lactase. Constant or persistent diarrhea may contribute to inadequate absorption of foods and nutrients in the presence of an adequate diet. Can you visualize what happened when a black mother insisted that the lactase deficient child drink milk?

Abnormal genes for hemoglobin are distributed throughout the world. These abnormal genes have been found in Greek Cypriots, Askenazic Jews, African Blacks and American Blacks. Interestingly, the gene pool distribution resembles the occurrence of malaria and for every 100 malaria deaths only one out of 23 expected deaths occurred in those having gene (Sickle-cell) trait).

Sickle Cell anemia is a homozygous genetic disease and both parent must carry the defective gene (heterozygous). When heterozygous parents, mate the likelihood of their having a child with Sickle Cell anemia is one in four. A large number of people are heterozygous to the trait. Approximately 10% of the American Black population are. Those who carry the trait do not have the disease itself. Such carriers do not suffer ill effects though high altitude or anesthesia are known to cause difficulties. Approximately one in

every 400-500 American Black infants are born with Sickle cell anemia. (See Table 8)

In a normal individual the life span of the red blood cells may be stopped from 10 to 14 days without ill effects. In a patient with Sickle Cell anemic red blood cells have a very short half life. If the sickle cell patient stops making red blood cells for a short time, the results are hazardous and Sickle Cell crisis may occur. Sickle cell crisis is a sudden and severe onset of the signs and symptoms of the disease which include abdominal pain, shortness of breath and leg ulcers.

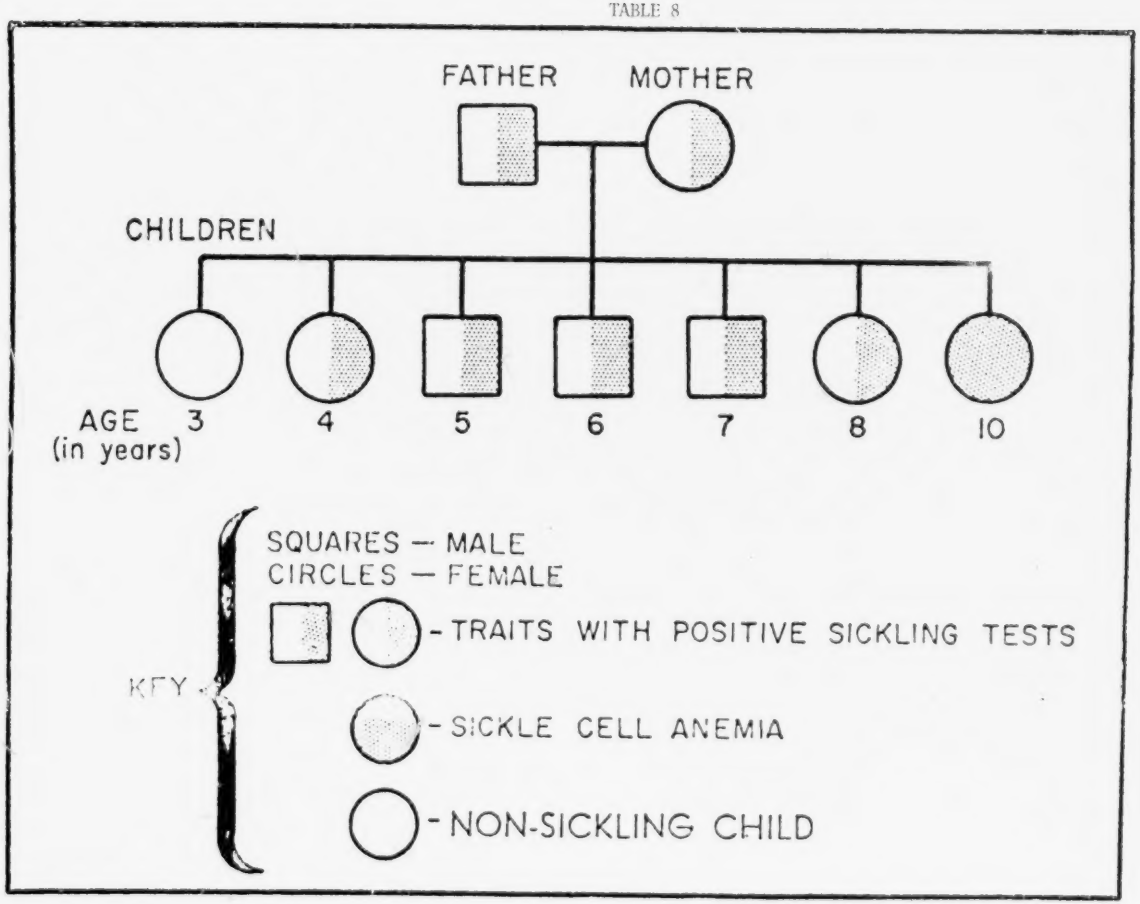
The sickling of cells functionally interferes with their oxygen carrying capacity. These cells carry an abnormal hemoglobin, hemoglobin S and hemoglobin C. When hemoglobins S and C occur in the same individual this causes SC disease (usually much milder than Sickle Cell disease). This latter condition is not prevelant among American Blacks.

There is no specific treatment for Sickle Cell Anemia. Sickle cell crisis is most frequently caused by an infection. From an immunologic viewpoint Sickle Cell patients are not immunodeficient. But frequently splenic failure occurs and this can produce a specific immunologic defect. Sickle Cell children and adults require protection against infection. The administration of penicillin or other chemotherapeutic agents prophylactically or for relative minor infections is recommended.

Iatrogenic Diseases

Iatrogenic diseases are drug induced diseases. We have already mentioned hemolytic anemias in certain people who have low levels of an enzyme in their red blood cells. The gene controlling the presence or absence of the enzyme is on the x-chromosome and therefore the trait is sex-linked (19). Many drugs have been suspected or shown to cause hemolytic anemia. Included are aniline derivates (acetophenetidin, and acetanalid), sulfonamides, 8-amino quinolines and nitrofurans.

TABLE 8


FATHER
MOTHER
CHILDREN
AGE (in years)
3
4
5
6
7
8
10
KEY
SQUARES — MALE
CIRCLES — FEMALE
- TRAITS WITH POSITIVE SICKLING TESTS
- SICKLE CELL ANEMIA
- NON-SICKLING CHILD

There are many more diseases associated with drug administration. I would like to mention a few:

1. Allergic diseases associated with drug use, air pollution are rapidly increasing. Many drugs are antigenic when bound to proteins and these diseases involve a cell mediated type immune reaction.

2. Drug diseases of social importance caused by morphine, marijuana, barbiturates, alcohols, amphetamines and laxatives are examples of drugs which have the property in some individuals to cause self-administration until untoward consequences (disease) occur. The tendency toward abuse and hence the popular term "drug abuse" is well-recognized and justified. Many of these drugs are addicting, i.e. morphine, barbituates, alcohol and amphetamines. These drugs cause great social problems and eventually endangers us all. Thus societal as well as personal ills result following their consumption. Where shall we begin to stop this needless waste of life and potential? The answer lies in no one discipline but a coordinated multidisciplinary approach.

3. Pschotomimetic diseases or drug induced pschoses. For example lysergic acid diethyl amide (LSD) induces a psychotic like syndrome in man as well as many laboratory animals. The effects of this compound on the chemistry and function of the brain is one of our strongest arguments for a biochemical theorem in mental illness.

Drug Interactions

This is probably one of the fastest growing problems associated with the medicinal use of drugs (20). Some of these interactions may be harmless and some fatal. Let me give you just two examples:

1. Discoumerol and phenobarbital: Phenobarbital induces the formation of drug metabolizing enzymes

and the metabolism of dicoumerol making this agent less effective in controlled intra-vascular clotting.

2. Oral hypoglycemic drug displaces Dicoumerol from plasma binding sites. Dicoumerol as a "free drug" inhibits clotting and may lead to uncontrolled hemorrhage.

There are so many possible drug interactions from therapeutic as well as over the counter drugs, that it is wise to inform your doctor what you take occasionally; home remedies or otherwise. In this age of medical specialization, where you may be receiving more than one prescription, it is wise to inform each physician of the other medications. So vast is the problem, that it may be brought under control only with the aid of a computer. It is further complicated by the fact that most over the counter items (OTC) contain more than one ingredient, and many prescription items are likewise compounded (Table 9).

Summary

Being a part of the health care can be a heart warming experience and a service to your fellow man. It is a multibillion dollar industry which most likely will not have depression. There are many opportunities for all of you on the health care team. You all must be informed and willing to work. You must be politically aware at all times, fighting to know the system and to use the system in your behalf.

Table 9

DRUG INTERACTION

Drug	Interaction plus Drug	Mecnanism
Antihistaminics	Potentiate	
	Norepinephine	Inhibits binding
	CNS Depressants	Additive effect
Sulfonamide	Potentiate	
	Anticoagulants	Displace binding
	Phenylbutazone	Displace binding
	Salicylates	Displace binding
Tetracyclines	Antagonized	
	Di and Trivalent ions	Forms comples
Tranquilizers	Potentiate (CNS depressant)	
Phenothiazine	Antagonize	
Haloperidol	(Narcotic analgesics)	
Meprobamate	Potentiate (CNS depressant)	
Sedatives	Potentiate (CNS depressants)	
Barbiturates	Antagonize	
	Analgesics - enzyme induction	
	Estrogen Progestrin - enzyme induction	

REFERENCES

1. Harrison, Y.E. and W.L. West, Stimulatory effect of charcoal-broiled ground beef on the hydroxylation of 3,4-benzpyrene by enzymes in rat liver and placenta. Biochem. Pharmacol. Vol. 20, pp 2105-2108, 1971.

2. Cardiovascular Diseases in the United States, Vital Statistics Monograph, Howard University Press, 1971, Morjiama et. al.

3. The Epidemiology of Hypertension. Stamler, et. al. Grune and Stratton, Inc., 1967.

4. National Center for Health Statistics, U.S.P.H., U.S.A, 1968. Quoted in Heart Facts, 1972. American Heart Association.

5. Intractable Heart Failure - Influence of Hypertension. Med. Annals of D.C. 24: 345, 1955. Johnson, et. al.

6. Guidelines for the Detection, Diagnosis and management of Hypertension populations.

7. "The prevalence of Diseases of the Heart in an urban center...." Jour. Chronic Diseases, 6:595, 1957

8. Circulation, 44: A-263, November, 1971. Report of I.C.H.D. Hypertension Study Group.

9. Effects of Treatment on morbidity in Hypertension. Results in patients with Diastolic Blood pressure averaging 90-114 mm Hg. J.A.M.A. 213: 1143, 1970. Fries, et. al.

10. The Government and the Peoples Health. N.M.A. 55, 42, 1963. Johnson.

11. Brewer, T., Nutrition and Pre-calmpsia, Obstet. Gynec. 33:448, 1969.

12. Brock, J. et.al. Monosaccharide content in Placental Polysaccorides of Healthy Pregnant and Toxemic Women. Am.J. Obstet. & Gynec. 93: 898, 1965.

13. Chaudhuri, S.K., Correlation of Toxemia with Anemia of Pregnancy. Amer. J. Obstet. & Gynec. 106: 255, 1970.

14. Chaudhuri, S.K., Relationship of Protein-Calorie Malnutrition with Toxemia in Pregnancy. Amer. J. Obstet. & Gynec. 107: 33, 1970.

15. Gordon, H. et. al. Genetic and Internal Aspects of Hypertensive Toxemia in Pregnancy. Amer. J. Obstet. & Gynec. 107: 254, 1970.

16. The Chemist, Vol. XLVII, April, 1970, No. 4, Article by G. H. Morrison.

17. Viewpoints on digestive diseases. Vol. 3, No. 2, March, 1971. Article by T. M. Bryliss.

18. Bradfield and Coltrin. Some characteristics of the Health and Nutrition Status of California Negroes. Amer. J. of Clin. Nutrition, Vol. 23: 420, 1970.

19. Goth, A. Medical Pharmacology, C. V. Mosby Publishing Co., St. Louis, Mo.

20. Hartshorn, E.A. (1970), Handbook of Drug Interactions. Donald E. Francke, Editor and Publisher, Cincinnatti, Ohio.

ACKNOWLEDGEMENT

The workshop, whose proceedings are reported herein, was supported by funds from the United States Office of Education, Department of Health, Education, and Welfare. The opinions expressed do not necessarily reflect the position or policy of the Office of Education and no official endorsement by the Office of Education should be inferred.

The cooperation of students, faculty and administration of the six member institutions of the Consortium as well as that of the Division of Social Sciences of Bennett College is hereby acknowledged.

Our sincere appreciation is due not only to the participants in the workshop for contributing their time and talent to the proceedings, but also to the program participants who shared their expertise and experience.

The preparation of this workshop's proceedings would not have been possible without the diligent efforts of the Consortium Staff. A special note of gratitude must be made to Miss Frances Harris, the Secretary, who directed the preseveering task of transcribing and the meticulous care of typing the proceedings for photo printing.

FILMED FROM BEST AVAILABLE COPY

The Six Institutions' Consortium is a functional arrangement to foster inter-institutional cooperation for the purpose of pooling resources and strengthening member institutions in the direction of achieving the overall quality improvement of undergraduate education. This cooperation is directed at the sharing of administrative know-how; faculty, staff personnel, and Institutional development; African, Afro-American Studies and cultural enrichment; improvement of curriculum, counseling services, and developmental education.

MEMBER INSTITUTIONS

BENNETT COLLEGE
Greensboro, North Carolina

BARBER-SCOTIA COLLEGE
Concord, North Carolina

SHAW UNIVERSITY
Raleigh, North Carolina

WINSTON-SALEM STATE UNIVERSITY
Winston-Salem, North Carolina

LIVINGSTONE COLLEGE
Salisbury, North Carolina

SAINT AUGUSTINE'S COLLEGE
Raleigh, North Carolina

six institutions' consortium
BENNETT COLLEGE • GREENSBORO, NORTH CAROLINA 27420 • PHONE (919)275-1907